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de l'Association canadienne des hygiénistes dentaires

VOLUME 37 NUMBER 1



*Ride the Tide
to Professional Pride*

*Ensemble, Soyons fiers
de notre profession*

13th Annual Professional Conference
September 20-22, 2002
Moncton, New Brunswick

13^e conférence annuelle professionnelle
Du 20-22 septembre, 2002
Moncton (Nouveau-Brunswick)



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Dreams Really Do Come True!

by Karen Wolf, DipDH

"If you can imagine it, you can achieve it; if you can dream it, you can become it."

— Margit Juhasz, RDH



Oui, les rêves se réalisent !

par Karen Wolf, DipDH

"Si vous pouvez l'imaginer, vous pouvez le faire ; si vous pouvez le rêver, vous pouvez le devenir."

— Margit Juhasz, RDH

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The CDHA Conference last September in Moncton, New Brunswick, had a theme that was both site-specific and timely: "Ride the Tide to Professional Pride." Professional pride is not something I or anyone else can instill in another person. Rather, this trait comes from experience in interpersonal and interprofessional relationships and is nurtured over time. Communication, however, is a key component in establishing and sustaining this trait.

The keynote speaker, Dr. Robert Buckman, spoke to us about the value of grooming our communication skills. He understood that as caregivers, we have both the education and clinical training to communicate efficiently and effectively with our clients. I would like to take this a step further by encouraging us to communicate more effectively with our dental team colleagues, our communities, and our collaborative health care providers.

John Donne said, "No man is an Island." This can also apply to the concept of a team. As dental hygienists, we are a valuable part of the dental team. We are not "the girls who clean teeth," nor are we "training to be a dentist." We are dental hygienists! We are not limited by our skills but rather use our skills to improve the overall health and well-being of Canadians. In this we should take pride and, in turn, value our profession. By profession, I mean both the profession of dental hygiene and the oral health profession as a whole. We have certainly progressed a lot over these past 50 years and together we can effect change in our health care system from coast to coast.

Many of you may remember a high school English teacher challenging the class to expand a specific metaphor to the entire novel. Well, I would like to use the "tide" metaphor from our conference and elaborate on it with respect to professional pride. First of all, a tide is slow and deliberate.

La conférence de l'ACHD, qui se tenait en septembre dernier à Moncton (Nouveau-Brunswick), avait pour thème : "Ensemble, soyons fier(e)s de notre profession", sentence qui correspond bien à la vague de fond qui soulève la profession. La fierté professionnelle n'est pas quelque chose que moi-même ou quelqu'un d'autre peut inculquer à une autre personne. Ce trait de caractère provient plutôt du vécu dans les relations interpersonnelles et interprofessionnelles, et il se cultive à longueur de temps. Par contre, la communication est une des composantes clés de l'établissement et de la durabilité de ce trait.

**We are not limited
by our skills but
rather use our skills
to improve the
overall health and
well-being of
Canadians.**

Le conférencier invité, le Dr Robert Buckman, nous a parlé de la valeur que représente le perfectionnement de nos compétences en communication. Il a compris que, comme pourvoyeurs de soins, nous avons reçu à la fois l'enseignement et la formation clinique nécessaires pour pouvoir communiquer efficacement et effectivement avec nos clients. J'aimerais pousser l'idée d'un cran en nous encourageant à communiquer de manière plus efficace avec nos collègues de l'équipe de soins dentaires, nos collectivités, et les pourvoyeurs de soins de santé avec lesquels nous sommes en collaboration.

John Donne a dit, "Personne n'est une île." Cette idée peut également s'appliquer au concept d'équipe. En tant qu'hygiénistes

dentaires, nous constituons une partie précieuse de l'équipe de soins dentaires. Nous ne sommes pas "les filles qui nettoient les dents", et nous ne sommes pas non plus "en formation pour devenir dentiste". Nous sommes des hygiénistes dentaires ! Nous ne sommes pas limitées par nos compétences, nous utilisons plutôt ces dernières pour améliorer la santé générale et le bien-être des Canadiens. De ce fait, nous devrions nous enorgueillir et, du coup, donner de la valeur à notre profession. Par profession, j'entends à la



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COVER PHOTO LEFT: Sandy Gillis (aka Jimmy the Janitor)
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Please see our advertisement on page 8.



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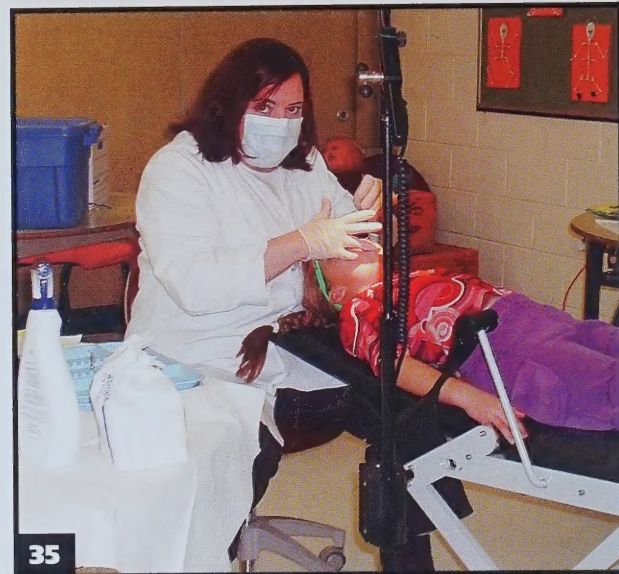
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We look forward to serving you!

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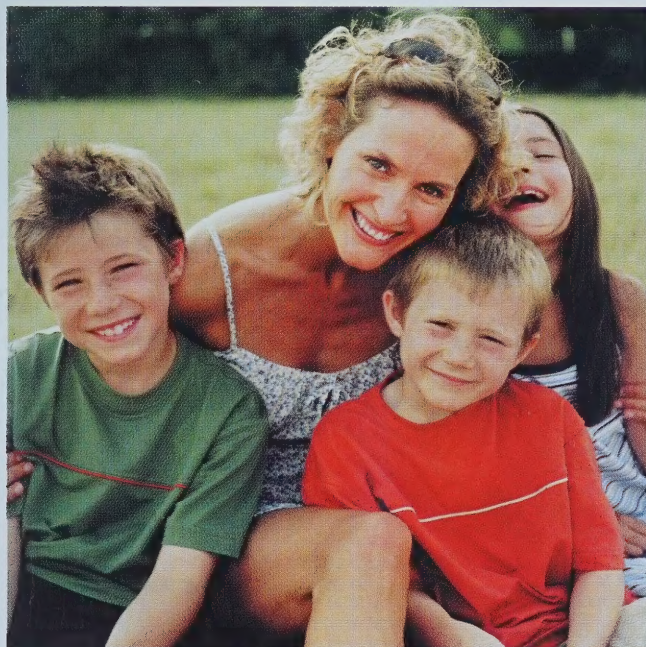
CORRECTIONS: On page 129 of the 2002 July/August issue of *Probe*, the second author's name should have been spelt Diana Dumkos-Cowie. On page 221 of the November/December issue of *Probe*, the fluoride position statements were approved by the CDHA Board of Directors on June 24, 2002.

HEALTHY BITES

Helen Bishop MacDonald, RD, MSc, FDC
Director, Nutrition, Dairy Farmers of Canada



KIDS WHO AVOID MILK DO SO AT GREAT EXPENSE



Parents of milk-avoiding children should be advised to seek professional advice on maximizing their children's teeth and bone health.

We know that kids in North America don't consume enough milk,¹ but the problem can actually start in the womb. Non-milk-drinking mothers who fail to get adequate nutrition, especially calcium, during pregnancy could be setting their children up for future problems with their teeth. As you know, both primary and permanent (i.e., first molar) teeth begin to develop in the prenatal period and continue into childhood.² What's more, children copy their mothers' milk-drinking habits,³ and moms who avoid milk are likely to raise kids who avoid milk, with some fairly serious consequences.

A recent study assessing dietary calcium intake and bone status in children 3 to 10 years indicates that long-term avoidance of cows' milk is associated with small stature and poor bone health.⁴ Bone density measure-

ments and food habits of 200 milk-drinking, fracture-free controls were compared to 50 healthy, milk-avoiding children whose mean calcium intake was low – 420 mg for girls, 478 mg for boys. These children were significantly shorter and heavier than their milk-drinking counterparts.⁴ Although heredity was not considered, reduced height is often observed in conjunction with inadequate nutrition (particularly protein) in children. The good news is that this outcome may be reversed. In another study, prepubertal girls with low calcium intakes gained height when supplemented with dairy calcium.⁵

Unfortunately, the first study's failure to measure energy intake also prevented forming conclusions about the reasons for the relative heaviness of milk avoiders.⁴ But, research indicates that low-calcium diets increase the body's efficiency at storing energy as fat, whereas high calcium diets optimize the use of energy as fuel.⁶ A study of preschoolers has shown that lower body fat is associated with higher calcium intakes and more daily servings of milk products⁷ while another of prepubertal children has identified low dairy food intake as a contributing factor for obesity.⁸

Milk-avoiding children were also shown to have smaller bones and lower bone mineral density than milk-drinking controls.⁴ And, in fact, distal forearm fractures had an annual incidence of 3.5% in milk avoiders compared to the expected 1%.⁴ It's likely that chronic milk avoidance – and failure to replace milk nutrients – is at least partially responsible for poor bone development.

In addition to calcium, milk also provides protein, phosphorus, and vitamins A and D, all vitally important nutrients for maintaining healthy bones and teeth.¹

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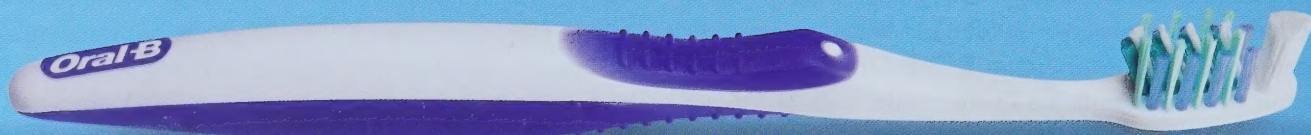
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1. *Am J Dent*. 2000;13(Sp Iss).

2. *Am J Dent*. 2001;14:273-277 (CrossAction vs Crest® SpinBrush™).

3. *Am J Dent*. 2001;14(Sp Iss):19B-24B (CrossAction vs Colgate® ActiBrush™).

4. Data on file (CrossAction vs Colgate Motion™).

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Shortage of dental hygienists?

by Susan Ziebarth, CDHA

"If one looks at the past and present concerns about health human resources in the country, it seems that the health human resource question might be characterized as a chronic national, now international, disease."¹



There has been much excitement in the pan-Canadian dental world within the last year about a shortage of dental hygienists. While the current data to support this claim is of questionable quality or is anecdotal in nature, the issue of health professional shortages is not unique to dental hygiene. It is interesting to note that at a time when acute shortage is being raised as an issue, advertisements for full-time equivalent dental hygiene positions are at a 21-year low.² Surveys of ads in key urban newspapers have demonstrated many more positions open for dental assistants.

Defining "shortage" is a research area in itself. It has been discussed at recent meetings with Human Resources Development Canada and Health Action Lobby. Much literature has discussed the issues of current and/or pending shortages in health care across a broad spectrum of professions. Recruitment, retention, and repatriation are key areas in which all health care professions need to work together to create strategies for a sustainable health care system.

Health Canada's *Health Manpower Inventory* (1976) estimated there were 211 dental hygienists in 1965 in Canada. Thirty-six years later, in 2001, this number had increased dramatically to 13,834.³ Over the same period, the ratio of dental hygienists to population also fell just as dramatically, from 1:16,637 in 1968 to 1:2,240 in 2001.⁴ With no corresponding increase in the number of dentists, the ratio of active dental hygienists to active dentists increased from 1:5 in 1977 to 1:1 in 2001.⁵

SHORTAGE OF DENTAL HYGIENISTS?... continued on page 23

Une pénurie d'hygiénistes dentaires ?

par Susan Ziebarth, ACHD

"Si on pense aux préoccupations passées et présentes, que nous avons dans ce pays, concernant les ressources humaines dans le domaine de la santé, il semble qu'on peut attribuer comme trait dominant à cette question celui d'être une maladie chronique nationale, qui prend maintenant une envergure internationale."¹

Au cours de l'année qui s'achève, on s'en est beaucoup fait dans le monde pan-canadien de l'art dentaire concernant la pénurie d'hygiénistes dentaires. Même si les données actuelles qu'on utilise pour soutenir cette présomption soient de qualité douteuse ou de nature anecdotique, la question des pénuries de professionnels de la santé n'est pas le propre de l'hygiène dentaire. Il est intéressant de noter que, au moment où se soulève le problème d'une pénurie aiguë, les annonces de postes d'équivalents temps plein en hygiène dentaire, sont tombées à leur point le plus bas en 21 ans.² Des études des annonces parues dans les principaux journaux urbains ont démontré qu'il s'ouvrirait beaucoup plus de postes d'assistantes dentaires.

La définition de la "pénurie" est un domaine de recherche en soi. Il a fait l'objet de discussions à des réunions récentes avec Développement des ressources humaines Canada et le Groupe d'intervention Action Santé. Une littérature abondante a discuté des questions de pénuries actuelles et/ou imminentes dans les soins de santé à travers un large spectre de professions. Le recrutement, la rétention et la repatriation sont des domaines clés dans lesquels toutes les professions de la santé ont besoin de travailler ensemble afin de créer des stratégies permettant la création d'un système de soins de santé renouvelable.

UNE PÉNURIE D'HYGIÉNISTES DENTAIRE ?...

suite à la page 38

Advertisements for

full-time equivalent

dental hygiene

positions are at a

21-year low.

Worthwhile change should never be coerced or forced. The slow, determined move of our profession toward national self-governance, improving access to oral health prevention and promotion, increasing public awareness of the dental hygienist's role, making a baccalaureate degree required for entry to practice, and more is evidence of an evolving profession—one of which we can all be proud!

A tide is also timely. As we learned at the conference from speakers such as Jan Pimlott, Terry Mitchell, and Dr. Michel D'Astous, there are current emerging concepts for the 21st century with respect to oral disease and its effect on systemic disease and population health. This information is both valuable and timely as our national health system is currently under review, with the prospect of restructuring over the next decade. Health prevention and promotion is being seen as a fiscally sustainable option for an overtaxed service delivery system. We as dental hygienists are well placed to assist in this sector of health care.

Another characteristic of a tide is that it occurs naturally, rather than being influenced by circumstances as it charts its course. According to Dr. Pran Manga, there are good and persuasive arguments for governments to permit dental hygienists to practise in alternate practice settings (i.e., long-term facilities). He stated that this would be a natural and logical approach to beginning the oral health care reform needed in our country. This move would achieve several very valuable public policy objectives that are not currently being met.

Finally, a tide has a mark or goal. As President, I can confidently say that your national association has a vision to advance the profession in support of our members and to contribute to the health and well-being of the public. But we cannot accomplish this without the incredible efforts of you, the members. I would like to take this opportunity to thank every one of you for your contribution to creating a profession of which we can all be proud. As partners, we have imagined and dreamed. Now we must achieve and become all that we are capable of becoming.

Karen Wolf can be reached at <president@cdha.ca>. 

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"OUI, LES RÊVES SE RÉALISENT !" (suite de la page 3)

fois la profession de l'hygiène dentaire et la profession de la santé buccale dans son ensemble. Nous avons certainement fait beaucoup de progrès pendant ces 50 dernières années et, ensemble, nous pouvons effectuer des changements dans notre système de soins de santé d'un océan à l'autre.

Beaucoup d'entre vous se rappelleront peut-être d'un professeur de français de l'école secondaire qui poussait la classe à étendre une métaphore particulière au roman tout entier. J'aimerais bien me servir de la métaphore de la "vague" qu'on appliquait à notre conférence et la développer dans le sens de la fierté professionnelle. Tout d'abord, une vague est lente et délibérée. Le changement valable ne devrait jamais être imposé ou forcé. Le déplacement lent et déterminé de notre profession vers l'auto-réglementation nationale, l'amélioration de l'accès à la prévention et à la promotion de la santé buccale, l'augmentation de la sensibilisation du public avis-à-vis le rôle de l'hygiéniste dentaire, le fait de faire du diplôme de baccalauréat une exigence pour l'accès à la pratique, etc. c'est la preuve qu'une profession est en évolution, ce dont nous pouvons tous et toutes être fiers !

Une vague arrive en temps opportun. Comme nous l'avons appris lors de la conférence de la bouche de conférenciers tels que Jan Pimlott, Terry Mitchell et le Dr Michel D'Astous, il existe actuellement des concepts en émergence pour le 21e siècle concernant la maladie buccale et son effet sur la maladie systémique et la santé de la population. Cette information est précieuse et opportune, au moment où notre système de santé national est soumis à un examen, avec la perspective d'une restructuration au cours de la prochaine décennie. La

prévention de la maladie et la promotion de la santé apparaissent maintenant comme une option durable pour une système de prestation de services hypothéqué à l'extrême. Quant à nous, en tant qu'hygiénistes dentaires, nous sommes bien placées pour prêter assistance dans ce secteur des soins de santé.

Une autre caractéristique d'une vague est qu'elle se produit naturellement, sans être influencée par les circonstances pendant sons cours. Selon le Dr Pran Manga, il existe de bons arguments et des arguements persuasifs selon lesquels les gouvernements devraient permettre aux hygiénistes dentaires de pratiquer dans des milieux de pratique alternatifs (par ex., les institutions de soins de longue durée). Il déclarait que ce serait là une façon naturelle et logique d'aborder le démarrage de la réforme des soins de santé buccale dont notre pays a besoin. Ce changement réaliserait plusieurs objectifs précieux de politique publique qui ne sont pas présentement atteints.

Enfin, la vague a une marque ou un but. En tant que présidente, je puis dire avec confiance que notre association nationale a une vision permettant de faire avancer la profession dans le soutien de nos membres et de contribuer à la santé et au bien-être du public. Mais nous ne pouvons pas accomplir ces objectifs sans les efforts que vous, les membres, y investirez. J'aimerais profiter de cette occasion pour vous remercier tous et toutes de votre contribution à la création d'une profession dont nous pouvons tous être fiers. En tant que partenaires, nous avons imaginé et rêvé. Maintenant nous devons réaliser et devenir ce que nous sommes capables de devenir.

On peut joindre Karen Wolf au <president@cdha.ca>. 

**Nous ne sommes
pas limitées par
nos compétences,
nous utilisons
plutôt ces
dernières pour
améliorer la santé
générale et le
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Canadiens.**

Perspectives on the 13th Annual CDHA Professional Conference



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to Professional Pride*

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September 20-22, 2002
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*Ensemble, soyons fiers
de notre profession*

13^e conférence annuelle professionnelle
Du 20-22 septembre, 2002
Moncton (Nouveau-Brunswick)

by Mary Pelletier, RDH,
and Sharyn Milroy, RDH,
Conference Co-Chairpersons



Mary Pelletier (l.), Sharyn Milroy (r.)

Did you have fun? T'es tu amusé? Did you learn a lot? As tu appris beaucoup? Did you meet former friends and classmates and make a number of new friends? As-tu rencontré les amis nouveaux et anciens?

From dawn on the Friday until Sunday when the last farewells were exchanged, the Delta Beauséjour in Moncton, New Brunswick, was a buzz of dental hygiene activity.

The conference theme, "Ride the Tide to Professional Pride / Ensemble, soyons fier(e)s de notre profession," was carried throughout the weekend. Seeing the provincial flags follow our "Majestic Red Maple Leaf" generated a rush of national pride and on the first notes of our national anthem, hearts began to race and eyes welled up with tears!

The opening ceremonies reflected this professional pride, from the eloquent music selections, the abundance of greetings from local government dignitaries and the presidents of both provincial and national dental hygienists associations to the warm words of Kimberly Benkert, president of the American Dental Hygienists' Association. Kimberly paid special tribute to the president of CDHA, Barb Gibb, and to Karen Wolf who would assume the CDHA presidency in October. There were also the touching award presentations to the conference sponsors and a super cruise aboard the "CDHA Liner" with Susan Ziebarth at the wheel. We laughed; we cried; we "rode the tide."

CDHA President Barb Gibb hosted a welcome reception following the opening

Mary Pelletier, a past president of CDHA and NBDHA, has employment experience in community health, ortho, and perio, and is currently employed in general practice. Mary is a graduate of Dalhousie University and recipient of its 1999 Outstanding Alumnus award. She is also a 2002 recipient of the NBDHA life membership and active on the self-regulation committee in New Brunswick.

Sharyn Milroy is a graduate of Dalhousie University and has worked for the past 32 years in general and periodontal practices. Between 1996 and 1999, she was secretary for the NBDHA, and since 2001 has been the NBDHA representative on the Board of Holland College.

ceremonies where everyone had an opportunity to mingle, greet each other, and plan an evening on the town. A music duo, Paul and Arthur, entertained on guitar and flute while conference registrants settled into conference mode for the next two days.

The scientific program covered a wide variety of dental hygiene practice applications and educational interests, including the following:

- Cardiovascular Health and Oral Hygiene [in both English and French]
- Alternate Practice Settings for Dental Hygienists
- CDHA Code of Ethics Workshop: Application to Day-to-Day Work
- Consumer Oral Health Care Products: Product Trends, the Evidence and Future Directions
- Floss or Die
- Community Connections
- Relationships between Oral Health and the Aging Individual
- Nutritional Influences on Dental Hygiene [featuring a local "Compounding Pharmacist"]
- Paradigm Shift in Early Caries Treatment: Emerging Concepts for the 21st Century
- Un Tour de table sur le blanchiment à la maison
- Communication Skills for the Healthcare Professional. Dr. Robert Buckman used humorous examples and laughter to guide us through his "Class" approach to effective communication.

As our profession matures with the tremendous variety of interests and dental concerns, it becomes difficult at conferences to choose among the many concurrent sessions. In fact, more and more registrants purchase the complete taped highlights of

On behalf of the

NBDHA organizing

committee, we

would like to thank

everyone for coming

to New Brunswick.

PERSPECTIVES ON THE 13TH ANNUAL
CDHA PROFESSIONAL CONFERENCE...

continued on page 39

Dental Hygienists wanted!



Exceptional employment opportunities are available throughout British Columbia for dental hygienists.

Do you enjoy sailing in the morning and skiing in the evening? *We've got it!*

Big city lights? *We've got it!*

Attractive starting salaries? *We've got it!*

If lifestyle and employment security are important to you, think about working in BC. Check out some of the positions available by viewing the Association of Dental Surgeons of BC's website at www.adsbc.bc.ca or phoning the Employment Opportunities Line of the BC Dental Hygienists' Association at 1-604-415-7671.

For registration enquiries, contact the College of Dental Hygienists of British Columbia at:

telephone: 1-250-383-4101

fax: 1-250-383-4144

e-mail: cdhbc@cdhbc.com



Association of
Dental Surgeons of
British Columbia

#400-1765 West 8th Ave.,
Vancouver, BC V6J 5C6
Tel: 1-604-736-7202

NEWS



RRSP or RESP?

With the federal government's announcement of the Canada Education Savings Grant program, you would like to set up a Registered Education Savings Plan (RESP) for your children, but you'd also like to contribute to your own Registered Retirement Savings Plan (RRSP). But there's not enough spare cash to take maximum advantage of both programs. What should you do? It's a tough decision.

With RRSPs, you can deduct the amount of your contribution from your taxable income and thus pay less in income taxes this year. In contrast, contributions to an RESP are not tax-deductible. But both programs permit you to defer taxes on the accumulating growth. With the RESP, however, the federal government will contribute to the RESP an amount equal to 20 per cent of the first \$2,000 per year that you contribute during the year for each child under the age of 18. That's up to \$400 per year, per child. While the RRSP will provide for your retirement, the RESP will allow you to set aside funds in a tax-effective manner to help finance your child's post-secondary education.

University and college tuition costs have been rising, and use of a computer is often a necessity in most programs. Student loans are not a comfortable resource, if the student amasses a crippling amount of debt by graduation. Most parents will make sacrifices to ensure that their children can complete their education and prepare themselves for a career. The government recognized this and changed the RESP rules a few years ago. Now, if there are accumulated funds remaining in an RESP when all the children have attained age 21 and are no longer in school, the parent can transfer up to \$50,000 (effective 1999) to his/her own RRSP or to his/her spouse's RRSP if the parent has enough unused RRSP contribution room to accommodate the transfer. Any excess will be taxable in the parent's hands and an additional 20 per cent tax imposed.

There are, of course, conditions to be met before you are allowed to transfer funds from RESP to RRSP: the RESP must have been set up at least 10 years before; all beneficiaries of the plan must have attained age 21; no beneficiary at the time is enrolled in a qualifying post-secondary education program.

The ability to transfer unused RESP growth to their own RRSPs can be an attractive option for those parents who began saving in an RESP early in their children's lives and who were unable to maximize their own contributions to their RRSPs. For more information, check the Canada Customs and Revenue Agency's web site at www.ccr-aadrc.gc.ca/tax/registered/resp-e.html.

CDHA Board Meetings: Highlights

June 24, 2002 The Board approved, in principle, the Fluoride Position Statements.

October 26, 2002 The Board unanimously chose to include the text on fluoridated supplements in the Fluoride Position Statements. ("The Fluoride Dialogue: CDHA Position Statements" appeared in the November/December 2002 issue of *Probe*.)

The **Mission and Purpose Ends Policy** was amended to include the following:

- A reworked mission statement:
The Canadian Dental Hygienists Association is the collective voice and vision of dental hygienists in Canada advancing the profession, supporting its members and contributing to the oral health and general well-being of the public.
- An additional item under "2. The needs of members are met."
2.6. There is an organizational structure to facilitate student mentoring.

Items 2 and 3 of the **Priorities Policy** were amended as follows:

- **2. Our secondary focus is on the professional growth of dental hygienists.**
We expect roughly 30% of our resources to be focused on:
 - 2.1. Supporting the efforts of educators, and the regulatory bodies, to have all students enrolled in a baccalaureate degree program as an entry to practice, and
 - 2.2. Educating the public about the new education standard.
 - 2.3. Dental hygienists have pride and confidence in themselves and the profession.
- **3. The remaining 20% of resources shall be allocated to the remaining Ends, with particular emphasis on:**
 - 3.1 The existence of a strong accreditation process.

The complete Mission/Purpose and Priorities Ends Statements can be viewed on-line. In the Members Only portion of the CDHA web site, select *Inside CDHA* and then *CDHA Priorities* (www.cdha.ca/members/content/inside_cdha/inside_cdha.asp).

Patty Wickstrom was acclaimed as CDHA President-Elect. 

13

Call for Nominations

for CDHA Distinguished Service Award and Life Membership

The CDHA Distinguished Service Award recognizes significant contributions for a minimum of four years by a dental hygienist or other person to the advancement of the dental hygiene profession or of CDHA at the national level.

The nominee's contribution may include, but is not limited to, work on a task force, committee, or innovative project. The service must have been national in focus, made a positive impact on the profession, and involved a substantial amount of personal commitment on behalf of the recipient.

CDHA Life Membership is awarded to an active member, in good standing, of the Canadian Dental Hygienists Association who has made an outstanding contribution to both dental hygiene and the association at the national level.

Dental hygienists nominated for Life Membership shall fulfill the following qualifications:

1. They will have maintained continuous CDHA membership in the active category for a minimum of 15 years.
2. They will have been involved in dental hygiene at the national level and in an official capacity for a minimum of 10 years.
3. They will have made a significant contribution to the growth and achievement of the national association, compared with others involved for the same length of time and in similar capacities.

For nominations to be considered by CDHA, we require the written support of two CDHA members in good standing. Nominators may submit only one nomination for this award. Submissions must be accompanied by a detailed curriculum

vitae of the individual being nominated, as well as an outline of accomplishments at the national level that the nominators consider worthy of this award.

Life Membership will be bestowed during CDHA's 14th Annual Professional Conference in Regina, Saskatchewan, in June 2003. The Board of Directors will designate Distinguished Service Award Recipients and Life Members at the Board meeting in March 2003. It would therefore be appreciated if you submit your recommendation no later than **March 3, 2003**. Submissions should be sent to: Canadian Dental Hygienists Association, 96 Centrepoin Drive, Ottawa, ON K2G 6B1. 



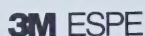
Thanks to CDHA's Sponsors



Special thanks to **Crest**, our Platinum Sponsor, for its support of dental hygiene education projects through its partnership with CDHA. As well as assisting with the presentation of the keynote address at our annual conference, Crest is making a significant contribution to the continued development of the members-only side of our web site. Thanks to the support of this much-valued partner, we expect to reach hundreds of thousands of Grade 1 students across Canada through our participation in the Crest School Kit.



Thanks to **Oral-B**, our long-time Silver Sponsor, for its support of CDHA and dental hygiene in general. Oral-B was involved in a number of ways this past year. In addition to supplying bags and gifts for delegates at our annual conference this year, Oral-B has sponsored health promotion and student award programs.



Thanks to **3M ESPE**, our Official Sponsor, for its assistance in the on-going development of the Technology and Innovation section of our well-visited web site.

14

Oral-B/CDHA Oral Health Promotion – Toothbrush Campaign



Oral-B, our partner in oral health promotion, has generously donated 25,000 toothbrushes for distribution to dental hygiene outreach programs. The toothbrushes are designated specifically for community outreach programs, schools or institutions to assist the dedicated dental hygienists who educate the Canadian population on the importance of preventative oral hygiene. There is a variety of styles available for infants, children and adults. You can photocopy the request form below and fax it to us at 613-224-7283.

Fax



THE CANADIAN DENTAL
HYGIENISTS ASSOCIATION
L'ASSOCIATION CANADIENNE
DES HYGIÉNISTES DENTAIRES

To: CDHA

From:

Fax: (613) 224-7283

CDHA ID:

Date:

Telephone:

Re: Oral-B/CDHA Toothbrush Campaign

Please send _____ boxes of toothbrushes.

(Please note that each box contains from 96 to 144 toothbrushes, and a minimum order of 1 box is required.)

My target population includes: *(Please note we will do our best to accommodate based on supplies.)*

☐ infants/toddlers ☐ pre-teen children ☐ teen to adults

I am a: ☐ Dental Hygienist ☐ Teacher

☐ Health Coordinator ☐ Other: _____

Briefly describe how you plan to distribute the toothbrushes: _____

Delivery Address: _____

Orders will be filled based on the nature of the outreach program and while quantities last.

Healthy Mouth ~ Healthy Body

A Mouth Care In-Service Pilot Project

by Mickey Emmons Wener,* BS (DH), MEd, CTESL, Carol-Ann Yakiwchuk,† DipDH, and D.J. Brothwell,‡ DMD, BEd, DDPH, MSc

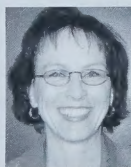
The following is based on a presentation made at the Community Connections session of the CDHA Conference in September, 2002, Moncton, New Brunswick.

Deer Lodge Centre (DLC), a 500-bed long-term care facility in Winnipeg, houses a dental clinic operated by the Centre for Community Oral Health (CCOH), the outreach department of the Faculty of Dentistry of the University of Manitoba. Initially a veterans' hospital, DLC offers personal care, rehabilitation, and chronic care programs as well as a variety of outreach programs for the community. Although DLC serves a predominantly older population, it is also home to many younger adults who require medical supervision and care. DLC's dental clinic has been in operation since World War I, with the university beginning its affiliation in 1982. In 2000, the CCOH established the Health Promotion Unit (HPU), based at the university, with dental hygienists Mickey Wener and Carol-Ann Yakiwchuk. Part of their mandate is to complement DLC's

* MICKEY EMMONS WENER is a full-time academic at the University of Manitoba, dividing her time equally between teaching in the School of Dental Hygiene and implementing a variety of oral health promotion initiatives for the high-risk target populations served by the Faculty of Dentistry's Centre for Community Oral Health. Drawing on her diverse career experience of almost 30 years, Mickey's focus continues to be reaching out to the underserved through teaching, health promotion, and as an advocate for increased access to care through regulatory change in Manitoba.



† CAROL-ANN YAKIWCHUK, a 1992 graduate of the University of Manitoba's School of Dental Hygiene, joined the Health Promotion Unit of the Centre for Community Oral Health in 2000, following eight years of private practice. While the majority of her efforts are focused on health promotion, she also works closely with students as a clinical instructor and provides clinical care at Deer Lodge Centre Dental Clinic two mornings a week. Committed to life-long learning, Carol looks forward to finishing her BSc (DH) this year and to undertaking graduate work in the near future.



‡ DR. BROTHWELL is Director, Centre for Community Oral Health, and Section Head, Community Dentistry, Faculty of Dentistry, University of Manitoba.



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Ensemble, soyons fiers(fes)
de notre profession

13th Annual Professional Conference
September 20-22, 2002
Moncton, New Brunswick

13^e conférence annuelle professionnelle
Du 20-22 septembre, 2002
Moncton (Nouveau-Brunswick)



Deer Lodge Centre, Winnipeg, Manitoba

existing clinical services with initiatives focused on prevention, health promotion, and increased clinical utilization.

Deer Lodge Centre, having already identified a need for mouth care training, was from the beginning very receptive to collaboratively developing a customized program for their nursing staff, which includes nurses and health care aides. The current article is our story of how this pilot project unfolded, from its inception in January 2001 until its wrap-up in April 2002. We discuss the groundwork required, the results of the pre- and post-assessment, the components and highlights of the three-part caregiver in-service program, and the teaching materials. Having learned much from both our successes and challenges, we take this opportunity to share our experience with you. We conclude with the spin-offs of our involvement and reflections on how we as dental hygienists can keep mouth care for this population on the front burner.

The dental hygiene process of care—assessment, planning, implementation, and evaluation—provided a framework for both our project and this article. While we present our account chronologically, assessment and planning were occurring simultaneously, as were implementation and evaluation, a case that often occurs in the real world.

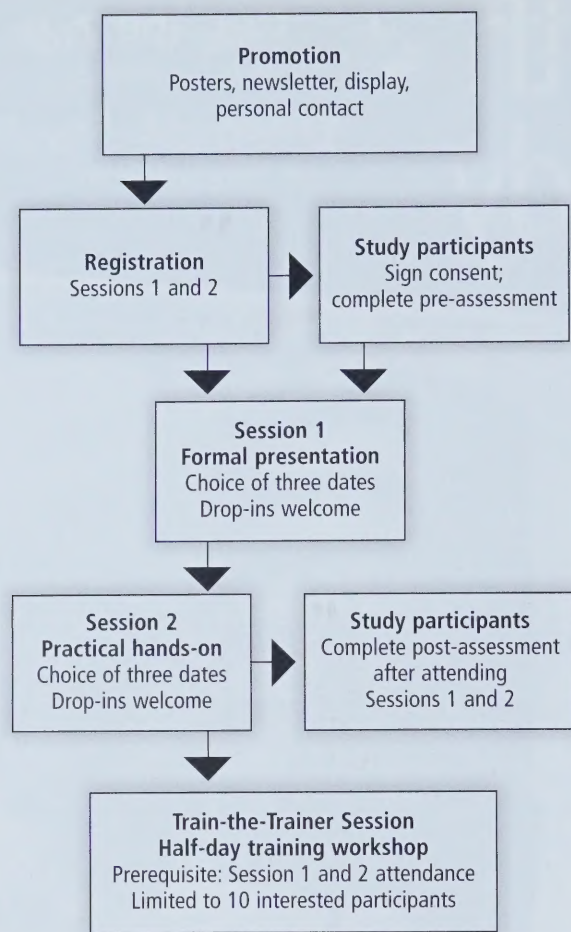


Figure 1. Training program flow chart

Assessment and planning: getting ready

THE GROUNDWORK

The first critical step was to identify and meet DLC's stakeholders—the chief medical officer, the director and assistant director of nursing, dental clinic staff, some of the unit coordinators, and the two nurse educators, our key Healthy Mouth ~ Healthy Body partners. Our strategy was to listen and learn in a non-judgmental fashion so that we could most effectively address their specific needs. While doing this legwork, we also began identifying the best evidence upon which to base our program and daily mouth care practice recommendations. We consulted the literature, tackling PubMed (National Library of Medicine's on-line database) with a vengeance, and began to search for existing resources and products specialized for this population. One of the most valuable resources was the *Oral Health Manual* published by Alberta's Lakeland Regional Health Authority.¹

PROGRAM DEVELOPMENT

After several planning meetings with Educational Services, it was decided that with our limited time and resources, we alone could not train DLC's entire caregiver population of 600, which included three shifts, day, evening, and night. The format that was ultimately chosen included offering both

Session 1 (presentation) and Session 2 (practical) on three separate occasions. Afternoon sessions, during the end of the day shift, were chosen to potentially attract registrants from both the day and evening shifts. In an effort to maximize attendance, we limited these sessions to one-hour segments. As well, there was a time lag between attending Sessions 1 and 2 to prevent overload and to allow for some reflection. We did not anticipate much participation from other shifts as care facilities such as Deer Lodge Centre do not have the financial means to encourage attendance off-shift. Therefore plans included videotaping Session 1 for those unable to attend live sessions. To extend the reach further and to build sustainability into the program, a half-day "Train-the-Trainer" workshop was planned where a small core of interested DLC staff would receive additional training to become peer mouth care trainers (see Figure 1). Our project's approach of training non-dental personnel to become vital peer resources has been shown to be successful in other long-term care settings, such as the Oral Care Link Nurse described by Charteris and Kinsella.²

The goals and objectives of the in-service program captured the importance of caregivers in long-term care facilities not only being knowledgeable and skilled, but also developing a favourable attitude toward providing mouth care.

Deer Lodge Centre caregivers will:

Goals

1. value the importance of the relationship between a healthy mouth and overall health for both residents and themselves;
2. provide effective daily mouth care services that will promote the oral and overall health of all residents;

Objectives

1. increase their knowledge of the many links between a healthy mouth and overall health and wellness; the causes and prevention of oral disease; how to perform mouth care; where to obtain mouth care products; the professional dental services located on-site at Deer Lodge Centre; existing Deer Lodge Centre's oral health policies;
2. value the importance of daily mouth care for themselves and the residents;
3. improve their practices related to providing daily individualized mouth care with a variety of residents, including those with teeth and those without; performing regular mouth checks during daily mouth care; identifying an oral problem and providing appropriate referral.

A questionnaire was used as a pre- and post-assessment tool in order to customize and evaluate the program. The assessment tool was a further refinement of a questionnaire developed initially for the University of Manitoba's 2000 National Dental Hygiene Week[®] event and included items adapted from previous research by Hardy et al.³ This project's two-page version of the questionnaire gathered data on the respondent's age, number of years providing mouth care, educational background, regularity of personal dental care, awareness of DLC oral health policies, perceived barriers to

providing mouth care, knowledge (16 true/false questions), frequency and level of preparedness for mouth care (15 services), and priority given to daily mouth care. (See Figure 2.)

We then began the process of writing the documentation to apply for ethics approval, by both DLC and the University of Manitoba's Research Ethics Board (REB). This included a detailed application, the study protocol, information participants would receive, and the consent and registration forms. It was critical to document the need for, and past effectiveness of, caregiver training. It was also essential to inform the program registrants that (1) participation in the study was voluntary; (2) choosing not to participate would not jeopardize their position at DLC; (3) responses would be confidential; and (4) there were no anticipated risks associated with participating. Registration and data collection would be handled by the DLC study coordinator, while program development, delivery, evaluation, and data analysis would be the responsibility of the Health Promotion Unit. By July 2001, our ethics proposal had been approved with only a few minor modifications required. This process not only helps to protect the study participants but also is necessary for reporting in many professional publications.

The following excerpt from the REB proposal documents the literature regarding caregiver training.

"It is a well-established fact that in Canada the proportion and number of persons over 65 is increasing. In industrialized countries, persons 85 years of age and over represent the fastest growing portion of the population; in Canada, 1/3 of those over 85 currently are living in long-term care (LTC) facilities.⁴

"Coupled with this is the fact that the proportion of those keeping their natural teeth is also increasing.⁵ Although the majority of older adults perceive oral health as important to their quality of life, noting in particular eating and comfort,⁶ it has been consistently documented that older adults, particularly those living in LTC facilities, are at increased risk for oral diseases.⁷ There are significant unmet dental needs in LTC facilities: dental prostheses in poor condition; poor oral hygiene; and a high prevalence of disease, including denture stomatitis, periodontal diseases, and caries.^{8,9} In spite of the obvious need, residents in LTC facilities frequently have difficulty accessing dental treatment due to transportation limitations, financial constraints, and low perceived needs. When residents do seek treatment, it is often of an emergency nature rather than for a routine dental check.^{8,10}

"To the health professions' discredit, the mouth has become disconnected from the rest of the body. In spite of serious ramifications such as oral cancer and systemic implications, oral problems are not seen as significant or worthy of attention; mouth care is often seen as a basic chore rather than a vital task.¹¹ Oral health is integral to general health as is being increasingly reported in studies where chronic oral infections have been linked to increasing individuals' susceptibility to cardiovascular disease, respiratory disease (i.e. aspiration pneumonia), arthritis, and diabetes.^{7,12} It has been estimated that between 30–60% of

homebound and institutionalized elderly are malnourished; poor oral health and tooth loss affect their ability to chew and change dietary preferences.¹³ Ensuring older adults have healthy mouths can improve their quality of life and may further increase their life expectancy.⁴

"As self-care becomes more difficult for the functionally dependent due to physical handicaps or impaired cognitive functions, oral care increasingly becomes the responsibility of caregivers. Although residents are requiring help with daily mouth care, many are not receiving it.⁹ Barriers to providing daily mouth care in LTC facilities are numerous. Those most likely to be involved in providing daily oral hygiene have been reported to be least likely to view oral care assistance in a positive light.¹⁴ Mouth care is often given a low priority compared to other tasks performed by health care providers; caregivers have indicated that they are doing the best they can, considering current staffing levels. Common reasons reported for not providing oral care include residents not wanting to be helped and caregivers deciding that residents were able to manage the oral care themselves.¹⁴ Providing mouth care is viewed by some as invading an individual's privacy, raising bioethical considerations regarding autonomy and informed consent.¹⁴ Difficult, uncooperative patients are frequently cited as a problem.¹¹ Oral care has been reported to be unpleasant and unrewarding, seen as the most undesirable task of caregivers, over changing diapers, feeding and hairwashing.¹⁴ Although carers have been noted to have positive attitudes toward their own and residents' health, they were also fearful of being bitten and disliked seeing food debris and mucus.¹⁵

Figure 2. Pre- and post-assessment tool



HEALTHY MOUTH ~ HEALTHY BODY

Deer Lodge Centre Nursing Staff Questionnaire

HEALTHY MOUTH~HEALTHY BODY
Pre- and post-assessment of mouth care in-service for
Nursing Staff at Deer Lodge Centre

- I have provided mouth care for others for ____ years.
- I am ____ years of age:

☐ 20-30
 ☐ 30-40
 ☐ 40-50
 ☐ over 50
- Do you personally go for dental care?

☐ YES, regularly once or twice a year
 ☐ YES, when I have a problem like a toothache
 ☐ NO, I do not go for dental care
- What BARRIERS do you face when providing mouth care for residents? (check all that apply)

☐ Not enough time to do it
 ☐ Residents who are uncooperative
 ☐ Don't know how to do it
 ☐ Supplies not available
 ☐ Think it's disgusting
 ☐ Does not seem to be a priority where I work
 ☐ Other, please specify _____
 ☐ I experience NO barriers
- Have you read or become familiar with DLC's mouth care policies for each of the following?

	Yes	No	Don't Know
a. Dental exams for new residents			
b. How often residents' teeth should be brushed			
c. What to do when a resident doesn't cooperate with mouth care			
d. Who provides mouth care products such as toothbrushes & toothpaste			
e. The role of the caregiver in checking the residents' oral health			
f. What to do if an oral problem is found			
g. How often residents should go for dental care			
h. What to do for dental emergencies			
- My highest level of education is:

☐ high school or less
 ☐ a diploma
 ☐ a degree

True or False? Check (✓) your answer...

	True	False	Don't know
1. The health of the mouth is directly related to the health of the body.			
2. You can chew just as well with false teeth as with your own teeth.			
3. When gums bleed during brushing, it's best to leave them alone.			
4. Foam toothettes clean teeth as well as a toothbrush.			
5. Older adults with dry mouth get more cavities.			
6. The most common cause of dry mouth is medication.			
7. Older adults with teeth do not need to use fluoride.			
8. Mouth rinses are a good alternative to daily toothbrushing.			
9. People with no teeth do not need to be seen by a dentist.			
10. Dentures should be removed for a few hours every day.			
11. Dentures that don't fit well can cause oral cancer.			
12. It's normal for residents to have pain and sores in their mouths.			
13. Residents, who do not cooperate with daily mouth care, are best left alone.			
14. Dental check-ups are as important as medical check-ups.			
15. Residents can lose their teeth if they remain dirty.			
16. As people get older, they naturally lose their teeth.			

"There is no one solution to addressing this significant challenge; however, educating key individuals both during training and while in the workforce, particularly those providing daily mouth care, is repeatedly expressed in the literature as a necessary strategy.^{3,9,16} Caregiver training programs have reported having a positive impact on the oral health status of residents^{8,17} and improving nurses' accuracy in completing oral assessments.¹⁸ Effective training that links oral health and quality of life is required in order to best meet the needs of residents.¹⁹ In addition to providing theoretical knowledge and practical training, educational programs should aim to establish positive attitudes toward oral health care and offer opportunities to discuss problems.¹⁴ Integrating dental personnel with LTC facility staff for training was seen as being preferable and beneficial.^{20,21} The climate for providing a mouth care in-service program is positive as interest in receiving additional oral care training has been expressed by the caregivers themselves."^{15,22}

■ MATERIALS DEVELOPMENT

One of the most beneficial, but time-consuming, aspects of this project was the development of a series of fact sheets. It was evident that in addition to the previously mentioned manual, everyone who participated needed to walk away with the basics. Based on reviewing the literature, perusing the Internet, and discussions with manufacturers and experts, we developed nine user-friendly handouts (using Microsoft Publisher) on the following topics: gloving, basic mouth care (with teeth), basic mouth care (without teeth), mouth care helpers, special considerations, dental recipes, monthly oral screening, dry mouth, and product suppliers.

Next came the development of the backbone of Session 1, a 60-slide presentation (using Microsoft PowerPoint). For Session 2, the practical component, backboards for three stations were developed (dentate, edentulous, monthly oral screening), participant product packages were assembled, and overheads to prompt discussion were made. Although the train-the-trainer materials were not fully developed until after implementing Sessions 1 and 2, we began the process of assembling 10 training kits, each including a manual, handouts, products for demonstration, and interactive learning activities. Open-ended evaluation forms were designed in order to gather feedback following each session.

■ PROMOTION AND SUPPORT

To increase awareness and promote registration, we worked closely with Educational Services to advertise the fall 2001 Healthy Mouth ~ Healthy Body training program. However, several issues came into play at this point: (1) there were a number of other DLC training opportunities occurring in the fall; (2) one of our two DLC partners was leaving for a position elsewhere; and (3) there was a shortage of staff, which made it a challenge to free up individuals to attend. After some deliberation, it was decided by all to delay the program until January 2002. This decision gave us additional time to increase staff awareness of the upcoming program through newsletter announcements and posters. On-site promotion also involved two University of Manitoba dental

hygiene students who helped staff a display located on "Main Street," DLC's main floor corridor.

As the planning progressed, it became evident that financial support was needed. Our commitment as the Health Promotion Unit was one of time and expertise, while Deer Lodge Centre absorbed the costs associated with delivery. Through the generous support of several manufacturers, we were able to gather many of the products we needed. However, the costs of purchasing numerous copies of the *Lakewood Oral Health Manual*, containers and items for the trainers, along with other expenses such as photocopying were beginning to mount. At this point, the study coordinator suggested that we submit a joint proposal to the Deer Lodge Centre Foundation for funding. With her guidance and support, Educational Services was able to secure a generous grant to offset costs.

■ REGISTRATION AND PRE-ASSESSMENT

In December 2001, nursing staff were encouraged to register for sessions being held in January, February, and March 2002. Due to the holiday break and general January inertia, registrations were slow to trickle in. Although we were expecting larger numbers, Centre staff reassured us that registrations were surprisingly high considering how difficult it is for nursing staff to leave co-workers who are already taxed in order to attend a training program during their shift, no matter how valuable it may be. With many registrants choosing to attend, but not participate, in the study, it became evident our numbers would not support the level of data analysis we had planned. In the end, we had approximately 60 registrants, with 27 participating in the study and completing the pre-assessment. Because of limited follow-up due to unavoidable DLC staff issues, only 11 of the 27 completed post-assessments.

We were very pleasantly surprised at the level of participation by DLC's speech language pathologists (SLPs). We quickly learned we have many overlapping professional concerns, as their role often includes an oral inspection associated with assessing swallowing and the general condition of the oral cavity. This opened our eyes to a logical future partnership between dental hygienists and SLPs. At DLC, the speech language pathologists do not provide daily mouth care; therefore, several portions of the questionnaire did not apply to them directly. Since they constituted about one third of the 27 pre-assessments, this influenced data results concerned with the provision of mouth care.

Although the data were scant and were not obtained solely from those providing daily mouth care, we were able to identify some trends using Epi Info for entry and analysis. The barriers to daily mouth care that received the most responses included: *not a priority where I work*, followed by *uncooperativeness* (of residents), *no time*, and *no supplies*. There was a perceived lack of policy awareness regarding *how to deal with uncooperative clients*, *what to do with a dental emergency*, and *how often residents should receive professional care*. Based on their answers to the true/false questions, it became apparent that they had limited knowledge about *the cause/effect of dry mouth*, *that ill-fitting dentures could be linked to oral cancer*, *that tooth loss is not part of natural aging*, and that *most*

mouthwashes are ineffective. In the daily mouth care skill section, no one reported *cleaning between* (the teeth), the majority felt unprepared to *screen for oral disease*, and most felt unprepared to use *therapeutic rinses that contain fluoride or chlorhexidine*.

Implementation: a glimpse of our program

■ SESSION 1: GETTING THE FACTS

We began Session 1 by sharing the results of the pre-assessment data, reinforcing the fact that we had tailored the program for them. To get the participants' buy-in, we emphasized the many reasons why dental disease has become an epidemic in long-term care while also acknowledging the challenges they face and their obvious compassion for others.

Session 1 – Get the facts

Large group presentation

(60 PowerPoint slides including 50+ digital photos)

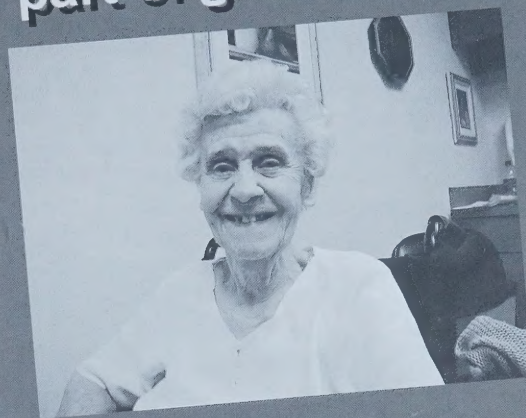
- Mouth~Body~Health links
- Plaque and dental diseases
- Mouth care strategies and specialized products
- Tour of the mouth
- DLC mouth care policies

Sharing current research findings that link poor oral health with systemic disease proved to be a major attention-getter, and one that set the stage for the section on the importance and value of effective daily mouth care. During the discussion on plaque, participants were interested to learn that even tube-fed residents require daily mouth care whether food is introduced into the oral cavity or not. Many were surprised that dental caries is in fact an infection linked to factors such as lack of food clearance; disease and drug-induced xerostomia; frequent eating; frequent consumption of sugars in candies, food supplements, and medications and that combining any of these with resistive behaviour can lead to rapid and serious destruction of the dentition. Preventive strategies were suggested, such as consuming food supplements through a straw, followed by a drink of water, and using fluoridated oral care products (pre-test results showed the majority of caregivers were unaware older dentate adults could benefit from its use).

While discussing the signs and sequelae of periodontal disease, we addressed the limitations of tooth replacement. Many residents in long-term care cannot tolerate denture fabrication procedures or wearing a denture once fabricated. And for some, the reduced chewing power of dentures often results in changes in both food choice and the amount consumed, leading to malnutrition, or more seriously, weight loss and morbidity.¹³ This emphasis on the perils of periodontal disease and resulting tooth loss—more than just a missing tooth or bleeding gums—was another key point that helped drive home the importance of daily mouth care.

To help caregivers define their role in maintaining residents' oral health, we utilized a continuum of care model, specifically the one to *remind~assist~provide*. Some residents may need only a gentle reminder to brush; others may require

Losing teeth is not a natural part of growing old



Session 1. Get the facts

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assistance; while others will be totally dependent on caregivers to provide daily mouth care. We have learned that “long-distance brushing,” blindly placing the toothbrush in the resident’s mouth with no retraction of tissues, is a common practice among caregivers. Many caregivers have been taught to “never put fingers in someone’s mouth.” Encouraging cheek and lip retraction and directing the toothbrush to the gumline was stressed. Using a moist, clean facecloth, gauze, or toothette is a strategy we recommended for “clearing the way” of debris, tissue cleansing, and toothpaste removal.

Caregivers were excited to learn about and see the many effective mouth care products available. Especially well-received were the time-saving partnering of the three-sided Collis-Curve™ toothbrush²³ with the Specialized Care disposable mouth prop, and for those with access to suction, the Plak-Vac suction toothbrush. Focusing on halitosis reduction through tongue cleaning got everyone’s attention (pre-test results indicated the majority did not include this as part of their daily mouth care regimen). Bad breath puts residents at risk for social isolation, not only from their family and fellow residents, but also from caregivers.

We emphasized that daily denture care was a combination of mechanical and chemical deposit removal, since neither was performed routinely. Many individuals may use commercial denture cleaners only when stain is present, not recognizing the bacteriocidal effect (99 per cent kill-rate) when using commercial denture cleaners.²⁴ With denture wearers at increased risk for candidiasis, incorporating daily chemical denture disinfection is critical. Emphasizing daily tissue care, thorough removal of all adhesives, and taking dentures out for a minimum of 4 to 6 hours for a rest period were also taught as part of comprehensive mouth care for denture wearers.

We encouraged the replacement of caries-causing dry mouth relievers—such as the ubiquitous sugar-containing mints and candies—with frequent sips of water, room humidification, and use of moisturizing products specifically designed for those with dry mouth. Biotene Oral Balance, although a



Session 2. Hands-on practice

mouth moisturizer, was also recommended for lubricating fragile lips during mouth care. Experts suggest that petroleum-based products can clog feeding tubes, are flammable for those on oxygen therapy, increase wound inflammation, and may contribute to aspiration pneumonia.¹ Biotene dry mouth toothpaste was recommended as an excellent choice for those with dry mouth, swallowing disorders, or dependent on others for care. Its non-foaming attribute improves visibility and reduces toothpaste volume during toothbrushing.

An oral health protocol would not be complete without some mechanism in place for regular oral screening. We encouraged a thorough and regular look in each resident's mouth to identify unusual/abnormal findings and to evaluate the current adequacy of a resident's daily mouth care. This is particularly important as mouth care needs of those with dementia can escalate very quickly, going from independent brushing to complete dependence on others for care in a short period of time.

A less than 50 per cent survival rate continues to exist for oral cancer¹³ as the mouth is often not included in other routine assessments. Caregivers were surprised to hear that the incidence of oral cancer is more common than cancer of the ovary, stomach, brain, thyroid, and cervix, to name a few.²⁵ For these reasons and others, we took our participants on a "tour of the mouth" using digital intra-oral pictures to help familiarize caregivers with some of the normal and abnormal findings in the oral cavity. Discussing caregiver contact with body fluids—frequently including blood—and showing pictures of Herpes Simplex I and Herpetic Whitlow supported the rationale behind gloving for mouth care procedures.

A key area of concern in long-term care is maintaining skin integrity. When skin breaks down, the resulting wound or pressure sore is measured, treated, and closely monitored. Explaining that the composite oral wound size of an individual affected by periodontal disease could potentially be as

large as the palm of one's hand not only raised eyebrows; it was information tailored and translated into their nursing language. And here we invented our new jingle: "Together, let's make gums as important as bums." Brushing teeth, which some equate with grooming activities such as combing hair, is indeed a "two-minute clinical intervention" to maintain oral and overall health. And, on that note, we ended Session 1.

The second time we presented Session 1, it was videotaped. Although an excellent strategy to offer the content to others not present, the videographer taped a still of each slide projected, with no speaker visible. We were disappointed in the result and would choose a different format next time. At this time, we are unsure how many caregivers, if any, viewed the video.

■ SESSION 2: PRACTICE WITH THE PRODUCTS

Session 2 was an informal and interactive opportunity for small groups of 10–15 caregivers to gain practical hands-on experience in mouth care. We welcomed the assistance of additional facilitators: two dental hygiene students and the dentist from the DLC clinic. We opened Session 2 with a discussion of any mouth care issues that had arisen since Session 1 and followed with a video clip²⁶ on positioning for mouth care, including suggestions for uncooperative clients. As a group, we then developed a list of tips "for getting in there" when providing mouth care for resistant residents. Mirroring, hand-over-hand brushing, offering a rummage box to keep hands busy, and partnering up for mouth care were just a few of the strategies generated. An overall theme that we continued to emphasize was "be creative and keep trying."

Session 2 – Try the products

Interactive learning stations

Positioning video/demonstration

Strategies for challenging residents

- Station #1 – Mouth care for those with teeth
- Station #2 – Mouth care for those without teeth/with dentures
- Station #3 – Oral screening and referral

Participants spent 15 minutes at three interactive stations where they watched demonstrations, asked questions, and then practised using the products we had introduced in Session 1. Most participants were not willing to partner up to practise mouth care on each other. The mouth is often seen as a very personal and sensitive space, with caregivers often reluctant to "invade" not only each other's mouths, but also those of residents who resist care. Caregivers were willing, however, to try the specialized products and practise the demonstrated techniques on themselves, which resulted in an unexpected positive outcome. Many remarked on how much they liked the taste/feel/adaptation of these products and this definitely increased their willingness to use them with residents.

At the "teeth and gums" station, they taste-tested Biotene products, practised mouth prop placement, brushed with regular and Collis-Curve toothbrushes, and tried out a floss

holder. At the “denture care” station, they observed and practised denture cleaning and labelling. Our “three-minute oral screening” station that focused on helping them to be more familiar with looking in someone’s mouth for anything out of the ordinary was received with some trepidation. Although many felt oral screening was important and should become an integral part of each resident’s current overall assessment, clearly most caregivers did not feel adequately prepared to perform this task or that it was their responsibility. Based on their feedback and our limited time, this portion was deleted for the last two sessions, leaving more time for practice at the mouth care stations. To encourage referrals and clinic utilization, participants were made aware of the dental clinic’s full range of services. Highlighted were the free initial entry exams, the importance of regular professional care, the fact that the clinic welcomes all and that ultrasonic denture cleaning was offered free-of-charge for residents’ dentures with heavy deposits. Many staff were not aware that they could also become patients.

The last segment of Session 2 was an on-unit mouth care demonstration with a consenting DLC resident. Unfortunately, this coincided with a shift change and we lost most of the participants. Unable to adjust the timing of the next two sessions, it was decided to move this portion to the Train-the-Trainer workshop.

As a wrap-up, we asked the group to tell us what were the “next steps” that were needed to support excellence in mouth care at DLC. This generated many comments, including the importance of the unit coordinators getting on board by hearing the same message, the need for informal mouth care demonstrations with residents on-unit, and access to specialized mouth care products. To encourage a personal commitment, participants were asked to define and record their own mouth care goals.

■ SESSION 3: TRAINING-THE-TRAINERS

Seven DLC staff members elected to become peer mouth care trainers at DLC. After participating in the two-part training program, they attended this additional half-day workshop to further prepare them. With support from the Deer Lodge Foundation, we were able to purchase and supply each mouth care trainer with an oral health demonstration kit containing basic and specialized mouth care tools and products, as well as the Lakeland Regional Health Authority’s *Oral Health Manual*. We developed several teaching tools, which served as learning activities during this workshop, but which could also be used for future peer training.

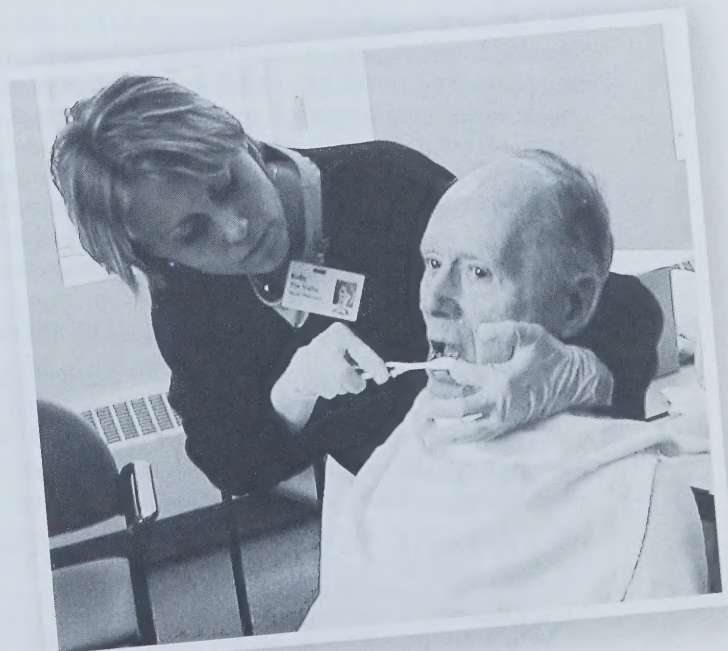
Session 3 – Train-the-trainer workshop **Half-day event**

- Oral Health Challenge – refresh and continue to learn
- Show & Tell Us – practise teaching using oral hygiene products
- Application – providing daily mouth care for a DLC resident
- Strategies for peer mouth care training

The “Oral Health Challenge” questionnaire served as a review of past information and helped us identify some deficits still remaining in their oral health knowledge base. It became clear that to facilitate learning, and particularly retention, the information we were sharing throughout the in-service program needed to be offered in a variety of ways with multiple exposures. To assist them in developing the necessary skills for teaching mouth care to others, we created an interactive game called “Show & Tell Us.” After familiarizing themselves with the contents of their demonstration kits, trainers taught the group about several oral hygiene tools—when and how to use them—with each pictured on a teaching card. The teaching materials were a very effective way to assist trainers in solidifying their new-found knowledge, as well as developing their own personal presentation style before taking the “show on the road.” Trainers then had the opportunity to select appropriate products, provide daily mouth care, and receive feedback for a consenting DLC resident.

Evaluation and reflection: How did it go and where to go from here?

Overall, the comments on the evaluations gathered at the end of each session were very positive. Participants were interested in the mouth-body-health links, welcomed the opportunity to practise mouth care using specialized products, and found the fact sheets useful. Many felt more motivated and equipped to provide better mouth care and were making changes to their own daily regimen. To date, there have been insufficient post-assessment data to determine if the program objectives have been met, specifically any significant change to caregivers’ knowledge, attitude, or skill. To rectify this shortcoming, we may administer an additional post-assessment to those who had both completed the pre-assessment questionnaire and attended Sessions 1 and 2.



Session 3. Program participant practising mouth care with volunteer resident; infection control at DLC consists of gloving with masking and eye protection optional.

As dental hygienists, we are accustomed to process evaluation, frequently assessing progress as we go along. This project was no stranger to unexpected challenges and constant adjustments. Nursing shortages, key staff changes, and scheduling training around shift changes were all factors that led us to ever-changing plans and to improvements. In our passion to spread the word in a limited time period, the clock became our worst enemy. On a positive note, each time a session was offered, we reflected on the experience, our time management, and the evaluations received. As a result of our on-going assessment, the Healthy Mouth ~ Healthy Body program continued to evolve and became more streamlined and tailored to this audience.

■ OUTCOMES OF OUR INVOLVEMENT AND VISIBILITY

This program and networking created a definite mouth care "buzz" with many positive spin-offs. To date, many caregivers, residents, and families have received mouth care information from peer trainers. Along with the resident dentist, we have been involved in the revision of DLC's oral health policies, which now include a quarterly oral screening by unit coordinators for all residents. At the dental clinic, there has been a significant increase in the number of new residents referred for an initial exam. Nursing is currently revisiting their policy on mouth care supplies, now aware that the current stocks of toothettes and mouth rinse are ineffective in controlling dental plaque. A variety of specialized mouth care products are now available at the Deer Lodge Centre gift shop. Caregivers are welcoming informal on-unit training from Carol-Ann Yakiwchuk as she follows up on residents who present with poor oral hygiene at their appointments. Beginning in November 2002, dental and dental hygiene students will receive valuable experience providing morning mouth care on-unit.

The "next step," a joint venture between the CCOH and the School of Dental Hygiene at the University of Manitoba, has been planned for March 2003. A full-day faculty-based continuing education program is being offered to caregivers, as the majority of staff are employed in settings without on-site dental professionals or clinics. Oral health professionals interested in facilitating caregiver in-services are also invited to attend. As we continue to provide and refine our program, we also look toward making our materials available to others.

■ AS A PROFESSION, WHAT ARE OUR NEXT STEPS?

As dental hygienists, we must continue to be change agents and keep oral health on the front burner for the sake of those who cannot care for themselves. We must be advocates for the vulnerable, helping facilities to put into place all the pieces to the oral health puzzle, including the following:

- getting everyone on board, from the CEO to the front-line caregivers;
- establishing supportive mouth care policies and protocols that are regularly updated;
- providing effective daily mouth care for all;
- ensuring regular access to a full range of clinical dental services;

- offering on-going caregiver training;
- making the connection with family/guardian regarding mouth care; and
- lobbying for supportive legislation that sets standards for daily mouth care and provides the public with direct access to the full range of services provided by dental hygienists.

**WE ENCOURAGE YOU TO TAKE A MOMENT
AND THINK ABOUT HOW YOU CAN MAKE
A DIFFERENCE FOR THIS POPULATION.**

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"SHORTAGE OF DENTAL HYGIENISTS?" (continued from page 9)

The recently completed profile of the dental hygiene workforce in *Dental Hygiene Practice in Canada 2001* shows a low attrition rate and a low inactive pool. The dental hygiene workforce is very stable with one-half of its members remaining in the same job over the previous 10 years.⁶

However, a recent study from the University of California indicates that in considering shortages, important information about preventive services will be lost if dental hygienists are measured only in relation to dentists and dental practice.⁷ The same critical review speaks of the need to examine indicators of unmet clinical need when considering definitions of shortage and to not focus on traditional provider ratios as indicators of shortage of oral health care.

There is a difference between demand and need in the population. There is a difference between professional expectations and public expectations. There are differentials in remuneration across the country and within different practice settings. There are changing scopes of practice and different regulatory requirements across all jurisdictions in Canada.

But any discussion of a perceived shortage has to look at professional education. Education of health professionals has faced the challenges of (1) low government support that forces higher tuitions, and (2) fear in the early '90s of oversupply in the health professions that led to a reduction in many health professional programs. Dental hygiene did counter this specific national trend: "Between 1988 and 2000, graduates in physical therapy, occupational therapy and dental hygiene grew, while the numbers in medicine and dentistry decreased."⁸ However, the field of health care in general has become a less desirable career choice for the country's youth who may believe that other fields such as high tech may offer a more rewarding career. Education programs are often not accessible to the populations who need the programs. For example, Aboriginal peoples who have great health care needs may have to move far away from

home and adjust to a different culture in order to obtain their education and then return home to their communities. These health human resource issues, common to most health professions in Canada, have an impact on access to care and health care outcomes.

An ageing population, advanced technology, and increased client populations with compromising and degenerative health concerns have put great pressure on dental hygiene diploma programs. A significant amount of additional essential content has been included in the curriculum over the last few years and it is overloaded. Practising evidenced-based dental hygiene and dentistry demands that practitioners keep abreast of all current research findings. These findings expand educational programs and make continuing education mandatory in most jurisdictions. New study areas include care of implant clients and exceptional-needs individuals; the ageing individual; current research on tobacco use and counselling; tobacco use and bone resorption; pain, fear, and anxiety control—to mention just a few. More recently, the impact of periodontitis on low birth weight babies and systemic disease has significantly affected the role of dental professionals, particularly those who do most of the preventive education and health promotion—the dental hygienists. The need to expand the current education programs to the baccalaureate degree is evident. The depth and breadth of education offered in a degree program allows the preparation of graduates who can meet the health care needs of Canadians now and in the future.

Shortages are affected by recruitment and retention, not by the length of initial educational preparation. Baccalaureate degrees are attractive to potential students and the possibility of being able to continue their education at the post-graduate level is a factor that aids in recruitment.

Recruiting dental hygienists is one thing; retaining them is another and is related to working conditions, salary or wages, and benefits. Dentistry, as an employer group, often refers to dental hygiene wages as being relatively high. But it

SHORTAGE OF DENTAL HYGIENISTS?... continued on page 46

Riding the Tide:

A Cruise into the Future of the CDHA

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by Susan Ziebarth

During the CDHA's 13th Annual Conference in Moncton in September 2002, Executive Director Susan Ziebarth likened the Association's professional journey to an ocean cruise. This article is based on her presentation.

"It is better to travel than to arrive."

Sailing, sailing...

Ocean travel can be full of surprises, from idyllic tropical islands to roaring tempests, and this has certainly been true of the CDHA's journey so far. But our voyage has never been boring, and what makes it even more worthwhile is our knowledge that our work contributes significantly to the health of Canadians.

Still, while we've sailed a long way together, our journey is far from over. But what will be our ship's next destination?

Choosing our destination

Before answering this, we should realize that putting to sea without having anyone in charge of our voyage is a very bad idea. So who should give us our destination?

The CDHA's board of directors will help us here. In case you weren't aware of it, the CDHA operates under a Carver Policy Governance Model. This means that while members of the board of directors may have differing visions of what dental hygiene is and where it should be going, a director cannot act in isolation from the other members. Rather, it is through the unified collective thought of these bright people that we choose our destinations. These destinations, called *Ends Policies*, are

- to ensure that there is a strong national voice and vision for Canadian dental hygienists;
- to ensure that the needs of the members are met;
- to help the profession continue its evolutionary process;
- to promote to Canadians the value of oral health as part of total wellness; and



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13th Annual Professional Conference
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Ensemble, Soyons fiers de notre profession

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Moncton (Nouveau-Brunswick)

- to ensure that there is professional growth for dental hygienists.

The board of directors, then, is like the cruise line that decides where our cruise will go. But before setting out, we need another essential item—a chart of the waters in which we'll be sailing.

Charting our course

As executive director, and therefore the captain of our cruise liner, I'm responsible for charting our course. But like any ship's captain, I must follow certain navigational rules. These rules are dictated by the board and provide guidance and parameters for me, so that I keep the ship safe and make sure that it sails in the right direction.

For example, I cannot cause or allow any practice, activity, decision, or organizational circumstance that is either unlawful, imprudent, or in violation of commonly accepted business and professional ethics. You'll notice that these rules are intentionally worded in the negative, so that I have more room to manoeuvre the ship according to weather conditions. There are other rules as well, about how the crew can be treated, about how the ship must be protected and so on... but I think you get the picture.

In addition to the navigational rules that help shape our course, there are organizations that regulate our profession as a whole—you might call them the coast guard. People are often confused about the relationship between their professional association and their regulatory body. This is even more confusing in those provinces where one organization performs both functions, so I'll try to clarify these cross-currents for you.

The most basic fact is that dental hygiene is a regulated profession across Canada. Regulation of a profession requires a system in place to ensure that the public receives quality care. In turn, the public trusts that a competent individual will provide such care.

To put it another way, the regulatory bodies want to guarantee that you are qualified to perform your work. At the same time, your professional association wants to ensure that you are successful in your career. These two goals are related in the sense that the regulatory bodies want to make sure your clients are safe, while the associations provide you with the tools that will help you comply with that requirement.

In British Columbia, Saskatchewan, Alberta, Ontario, and Quebec, dental hygienists are self-regulated. This covers 92 per cent of the licensed dental hygienists in Canada. Because of self-regulation, this majority is directly accountable to the public and not to another profession.

Manitoba and the Atlantic provinces, however, don't have self-regulation, so hygienists in these provinces have very limited ability to influence:

- scope of practice;
- supervision requirements;
- public's access to care;
- requirements for entering practice;
- quality assurance mechanisms, such as continuing education;
- disciplinary processes and actions;
- portability between provinces; or
- dental hygiene concerns and issues at the national level.

Recommendations from the Manitoba Law Reform Commission clearly state that regulation of one profession by another does not serve to protect the public and in fact perpetuates monopolies over services. Self-regulation, consequently, is an important issue for every dental hygienist in this country, whether they are already self-regulated or yet to be self-regulated. The CDHA has therefore been assisting provincial associations that are seeking self-regulation.

So now we have a cruise line (the board of directors) to decide our destination, and a captain (the executive director) who charts our course toward our it. We also have a coast guard to ensure the safety of the public. But what actually moves our ship forward?

You do! We have hundreds of people who have volunteered their time, found their voice, and stepped forward as leaders within the profession. They have participated in task forces such as the Code of Ethics Task Force and the Scope and Practice Standards Task Force; they have worked on committees such as the Conference Planning Committee. They have served on boards of directors and have taken time to provide input during requests for member consultation. It's their participation that propels us along our course.

Staying on course

Let's consider a ship's wheel. How many does our ship need?

Just one, obviously—trying to steer two different courses at the same time can only lead to confusion and shipwreck. To make forward progress, we have to guide our ship with a single wheel. But how do we make sure we do this?

Well, to begin with, dental hygienists do not have the resources of other health care professionals, so we have to

share. Moreover, we have to be smarter in using those resources we do have. So, before we act, we must consider all the ramifications our actions will have, not only in our own community or province but also outside our geographical borders. We must ask: If this has been done before by someone else, do we need to do it again? How can we help each other? How can we share our efforts and resources to keep us moving forward together?

You'll see some of the ways we are doing this when we revisit past ports of call along our course. In the meantime, we can think of the one wheel as being defined by the four C's of CDHA. First is a central spokesperson, the **coordinator** who connects us all. Next come **communication** and **collaboration** to identify the best practices for our profession. Last, but certainly not least, is the fostering of a strong dental hygiene **community**.

Ports of call: where we've been

Our cruise has visited many ports during the past year, from improving the CDHA's presence on the Web to revising our code of ethics. In case you haven't been along for the whole voyage, here are the places we've been:

- **Knowledge management:** We've improved our information and communication infrastructure with a new web site design that focuses on helping users find information easily. (You'll find us at www.cdha.ca.) We've also developed a members-only portion of the site to provide additional services for CDHA members.
- **Political Economy of Dental Hygiene:** This report, written by Dr. Pran Manga, was released in September 2002. It unequivocally recommends that provincial governments eliminate regulations that prohibit or inhibit the public's direct access to dental hygienists. This would permit dental hygienists to provide services in alternative practice settings, such as long-term care facilities, schools, community health centres and outreach programs for populations that are remote or hard to serve.
- **Profile 2001:** In 2001, the CDHA undertook this study to investigate the deployment of dental hygienists in Canada. The profile provides information that is essential for planning the human resources needed for the oral health segment of the health care system.
- **Fluoride Dialogue Paper:** At the June CDHA board meeting, the *Fluoride Dialogue Paper* and the *Fluoride Position Statements* were approved.
- **Teeth Whitening Research Review:** At the request of the ODHA in December 2000, the CDHA commissioned Marilyn Goulding to research the subject area of teeth whitening.
- **Revised Code of Ethics:** The *Code of Ethics* sets down the values and standards of our profession. A national task force revised the *Code*, which was posted for consultation and was approved by the board of directors.
- **Revised Dental Hygiene: Definition, Scope and Practice Standards:** The *Definition* has been revised to serve as an introduction to the discipline of dental hygiene today, including national standards for practice and the management of dental hygiene services and programs.

- **Dental Hygiene Client's Bill of Rights:** The CDHA now offers the public a *Bill of Rights*, describing what Canadians can expect of their dental hygienist and what rights they have when under care.
- **Access to Care Position Paper:** This paper is being drafted and will be presented to the membership for consultation early in 2003.
- **National Research Agenda:** We have obtained funding from the Dentistry Canada Fund to assist with the establishment of a National Dental Hygiene Research Agenda. This process will culminate in June 2003.
- **Romanow Commission:** In October 2001, we submitted a brief to the Commission on the Future of Health Care in Canada. This is an opportunity for the CDHA to highlight the connection between oral and general health and to advocate increased access to dental hygiene services.
- **Kirby Commission:** In February 2002, we submitted a brief to Senator Kirby, Chairperson of the Standing Senate Committee on Social Affairs, Science and Technology. The brief highlights areas where oral health issues have received inadequate attention and recommends ways of removing these shortcomings.
- **Health Action Lobby (HEAL):** The CDHA is a member of HEAL, a group that focuses on access to health care for Canadians. The CDHA actively participates in HEAL committee meetings.
- **Canadian Alliance of Professional Associations (CAPA):** As a member of CAPA, the CDHA is helping to develop a universal coding strategy for professional services for third-party payers. This is a long-term project, so we do not expect to see concrete results for three to five years.
- **Canadian Public Health Association National Literacy and Health Program (NLHP):** The CDHA is working with the NLHP to include an active commitment to literacy in the national political and health agenda.
- **Oral Health Sector Study:** The CDHA, in collaboration with Human Resources Development Canada, was responsible for establishing a body to be legally responsible for this project. The study will provide Canada with a comprehensive human resource strategy for the oral health care sector.
- **Canadian Foundation for Dental Hygiene Research and Education:** The Foundation has been incorporated with a board of directors and has submitted an application for charitable status.
- **Third-Party Reimbursement for Dental Hygiene Services:** The key focus for this initiative is the acceptance by third-party payers of dental hygiene electronic claims, and the technical architecture to support electronic payment.
- **Workshops on self-regulation:** The CDHA has coordinated and supported self-regulation workshops in Halifax, Burlington, Winnipeg, St. John's, and Moncton.

The marine weather forecast

It's always a good idea before setting sail to get a weather report—what prevailing winds can we expect as our ship cruises toward the horizon? Here are some of the sunny

breaks and a few of the storm clouds that are appearing on our weather radar:

- **Citizens' Dialogue on Health Care:** The CDHA's oral health policies align with many of the key findings in this report. Both chart a path for health care that involves prevention, health promotion, accountability, and the reorganization of service delivery.
- **Alberta Premier's Advisory Council on Health:** The report from the Council unfortunately makes recommendations that will result in limited health care access for low-income earners. On the other hand, it does recommend improved health education, particularly for children and youth. This supports the best long-term strategy for sustaining the health system, which is simply to encourage people to stay healthy.
- **The U.S. government's *Oral Health in America: A Report of the Surgeon General* (2000)** presents ground-breaking research that not only provides comprehensive oral health information but also informs readers about the link between oral and general health and well-being.
- **In the United States, there appears to be a thrust, supported by dentists' organizations, toward on-the-job training for dental hygienists.** The American Dental Hygienists' Association (ADHA) sees this as a trend toward diminished standards of dental hygiene education. The ADHA states that such lower standards would "represent a real public health hazard, because they would allow oral health care workers with no or inadequate education or clinical training to treat unsuspecting oral health patients."
- **In Canada as well, there have been initiatives aimed at preventing dental hygienists from raising the educational standards of their profession.** For example, in the July/August 2002 issue of the *Journal of the Canadian Dental Association*, the President's Column had this to say: "While respectful of the wishes of hygienists to advance their level of education, the need for it is not evident. Present-day training is seen as adequate for the dental office setting."
- **Dental hygiene remains a predominantly female profession whose members are employed in traditional dental practices in an hierarchical employment relationship.** Consequently, the profession has an array of socially constructed roles and relationships, personality traits, attitudes, behaviours, values, relative power, and influence that are imbedded in society. Related to these are "glass ceiling" and other gender issues that are still to be overcome.

Sailing into our future

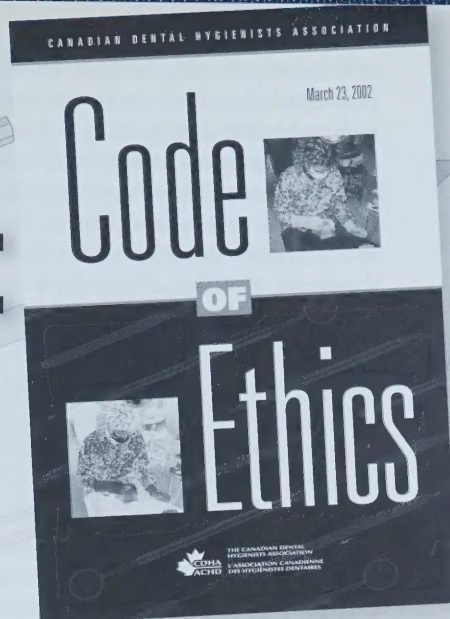
As you can see, this is a very long cruise we've embarked on. Dental hygienists in Canada have been sailing into the future for 50 years now and our voyage isn't over yet. Of one thing you can be sure though—the CDHA and your provincial associations will always work with you to steer you away from hidden reefs.

So, here we are, about to sail from our latest port of call, with many miles of ocean behind us and many more ahead. It's time to raise anchor again, start the propellers turning, and point our liner's bow toward our new horizons. 

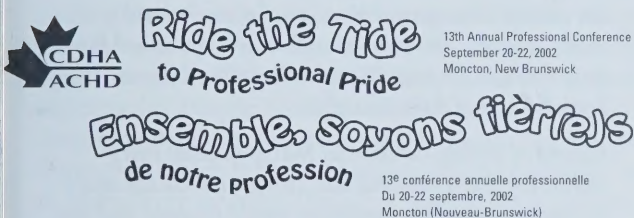
CDHA Code of Ethics Workshop:

Application to Day-to-Day Work

Facilitators: Nancy Neish and Laura MacDonald



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The following article was modified and adapted from the CDHA Ethics Workshop at the CDHA Conference in September 2002 in Moncton, New Brunswick.

Introduction

"You are unique, just like everyone else."

(Church sign announcement, Winnipeg 2002, and a billboard display in a bar, Mayan Riviera, Mexico, 2002)

Is it true that "you are unique just like everyone else"? Are you unique as a dental hygienist? If you are unique (which you are) but like everyone else (which you are), what guides your actions, thoughts, and values? Is it your "uniqueness" or your "sameness"? As professionals, dental hygienists practise according to practice standards. This makes each and every dental hygienist "just like everyone else." The client community must know dental hygienists abide by a strong sense of "providing good" and that they practice in an ethical manner at all times. They do so as individual dental hygienists, unique in their own way, but also, assuredly, just like everyone else. Hence, the *Code of Ethics* is the guide for all dental hygienists that identifies the ethical principles and standards of the profession.

The CDHA *Code of Ethics* has existed for over 30 years and has been revised three times. Its purpose is to (1) "elaborate the ethical principles and standards by which dental hygienists are guided and under which they are accountable"; (2) "serve as a resource for education, reflection, self-evaluation, and peer review"; (3) educate the public about the ethical principles and standards of the profession; and (4) "promote accountability."¹ As a professional community,

dental hygienists believe their "primary responsibility is to the client, whether the client is an individual or a community."² This fundamental principle underlies the *Code*. Given this, and the fact that dental hygiene is a licensed/regulated profession, the CDHA acknowledges dental hygiene actions can cause harm to the public. Hence principles/standards must be established to guide dental hygienists collectively ("just like everyone else"), so all persons receive high-quality dental hygiene care.

The CDHA *Code of Ethics* is a public document. Discussion of it ensures better understanding and application of the principles and standards of the *Code*, helping to bridge philosophy to practice. The CDHA launched the *Code of Ethics* (3rd edition) at the CDHA conference in Moncton, New Brunswick, in September 2002. Thirty people attended the CDHA *Code of Ethics* workshop. Nationally, participants represented dental hygienists from a variety of settings, including but not limited to the following: clinical practice, education, regulatory bodies, professional associations, and community health practice.

In all dental hygiene settings, dental hygienists (whether they realize it or not) deal on a regular basis with ethical violations, ethical stress, and ethical dilemmas. Gaston, Brown, and Waring surveyed over 2,200 practising dental hygienists who were members of the American Dental Hygienists Association.³ The 40-item mailed questionnaire was returned by 68 per cent of those surveyed. The most frequently reported ethical dilemmas were the following: (1) infection control, observation of behaviour in conflict with standard of practice (66 per cent); (2) lack of referral to a specialist such as a periodontist (60 per cent); and (3) non-diagnosis of dental disease (58 per cent). To practise dental hygiene, the professional must be competent in identifying and responding to ethical dilemmas to ensure high-quality dental hygiene care for all.

The CDHA *Code of Ethics* offers principles and standards that facilitate decision-making to "do right" when confronted with ethical dilemmas. The process of "doing right" is as important as the outcome. Ethical dilemmas processed

in a systematic way, using a decision-making framework, may conclude with a variety of right or possible options, with one being chosen as the best one for the current situation. Is there always a clear "right" that is distinct from all the other solutions? The answer is no. It is highly dependent on the situation, events leading to it, considerations of the facts and implications, and careful reflection and conclusion on the course of action. The competent dental hygienist must continually enhance his/her skill in choosing the best course of action.

Do underlying core values and morals remain intact? If society believes it is "wrong" to lie, cheat, and steal, and "right" to treat others the way we expect to be treated, then do not these values guide us in all aspects of our life? Chiodo states that ethically we have an individual and a collective value set that may or may not be the same.⁴ These values coincidentally may be the same, but he states professional values are not derived from personal ones. Professional ethics are based on education and practice experience, practice standards, codes of ethics, and other sources. The professional must recognize when personal values ("I am unique") are different from professional ones ("just like everyone else") and choose in their professional life to abide by the collective professional ethical values/standards. The CDHA *Practice Standards* and *Code of Ethics* guide our behaviour in the work environment but do not apply directly to our home or leisure activities.

The purpose of the workshop and this article (based on the workshop) is to encourage the dental hygiene community to embrace the *Code* and apply it to their everyday dental hygiene practice. This paper discusses the following: (1) conceptual differences between law and ethics; (2) the privilege of being a health professional; (3) the need for a code of ethics; and (4) the five ethical principles (and their standards) of the CDHA *Code of Ethics* and decision-making model applied to everyday dental hygiene practice. Some of the discussion takes place around a fictional story portraying a dental hygienist confronted with an ethical dilemma.

Law versus ethics

Our North American society (collective voice, the "just like everyone else") defines the lowest standard of acceptable behaviour, "the law." The legal system provides statutes (laws enacted and written by legislatures), regulations and rules, judicial decisions, and other means to regulate social conduct.⁵ Health professionals as part of society in general must abide by this system, and in addition, by the practice standards of their licensing/regulation authority. Ethics can be thought of as a higher order of conduct—elevated beyond social conduct to that of always promoting good for others. For example, we could say we do not commit crimes because it is against the law and if caught, we face prosecution. We do not drink and drive because it is against the law and if caught, we face criminal charges. But is this the only reason we do not do these things? The law defines the lowest level of acceptable behaviour, so if we do not drink and drive only because it is against the law, it is solely the lowest level of acceptable behaviour that is guiding our actions. If we do not drink and drive because it can cause harm to others and to ourselves, our behaviour is guided by morals and ethics.

We do not want to cause suffering; we want our action to "do good."

Is it acceptable for dental hygienists to practise at the lowest level of acceptable behaviour (the law) or does the profession have a moral and/or ethical obligation to the public to do more than this? Workshop participants were presented with a following fictional situation, adapted from a case study by Scheirton of the University of Texas Health Science Center.⁶

Freda arrives for her dental hygiene appointment wearing a short sleeve blouse that reveals a bandage wrapped around her forearm. During the health history, Margo, the dental hygienist, asks Freda about the bandage. Freda reveals she had attempted suicide twelve days ago and is currently in counseling with a psychologist. Since this and other information obtained did not contraindicate proceeding with the appointment, Margo carried on with the periodontal therapy.

The appointment went well. Freda seemed relaxed and cheerful. After she left, Margo noticed a blue journal on the counter. She opened it to reveal a psychologist's name, address, and phone number. She continued flipping through the journal and soon realized it was Freda's diary of daily thoughts.

Instead of closing the journal Margo read an entry indicating that Freda planned to attempt suicide again on the weekend. Her roommate would be away and she was going to be alone.

Workshop participants were asked the following questions:

- WHAT *SHOULD* VERSUS *WOULD* MARGO HAVE DONE IN THIS SITUATION?

Margo *should* have opened just the front cover in order to identify the owner's name and then placed the journal in safekeeping with the intention of returning the journal unread. She should not have read the journal. But it *would* be reasonable to look at the front cover and identify the person to whom it belonged. So the *would* and *should* seem to be one and the same regarding identification of the journal. However, the *would* and *should* are different when it comes to reading the entries.

- HAS A LAW BEEN BROKEN?

Has Margo broken a criminal or civil law in reading Freda's diary? Has Margo intentionally or unintentionally caused physical or mental harm to Freda and/or her property? This may be clear to some and less clear to others. The standard of care by a reasonable prudent person would be to identify the owner of the journal so it may be returned. Reading it beyond that purpose may violate privacy, but whether this violates a civil law or not is questionable. Being that Freda left the journal behind in Margo's "space," did Freda give up her privacy to Margo? Is reading another's journal entry actually against the law or just plain "not nice"?

- IS THIS AN ETHICAL VIOLATION?

Ethical violations occur "when dental hygienists fail to meet or neglect their specific ethical responsibilities as expressed in the Code's standards."⁷ Principle III (**Privacy and**

Confidentiality) states “privacy pertains to the individual’s right to decide the conditions under which others will be permitted access to his or her personal life or information. Confidentiality is the duty to hold secret any information acquired in the professional relationship...subject to certain narrowly defined exceptions.”⁸ Why did Margo continue to read the journal entry when clearly she must have realized she was reading Freda’s private thoughts? Or perhaps Freda wanted Margo to know and left her journal on purpose as a cry for help. Much of this is speculation. Freda has the right to decide who will have access to her personal life. Margo did not give Freda that right and hence, an ethical violation may have occurred by Margo continuing to read the journal.

To add to the scenario, participants were given additional case information:

To complicate matters, Margo tells her co-worker what she has done, so now the co-worker also is aware of Freda’s expressed plan to commit suicide.

Has Margo violated the ethical principle of **Confidentiality** by telling her co-worker about the contents of Freda’s diary? Does the principle not say “subject to certain narrowly defined exceptions”? What would those narrowly defined exceptions be? Despite how the information was derived, is Margo not attempting to seek counsel in how to manage the information, which is beyond her own scope of practice? Is this Margo’s cry for help? The act of reading Freda’s journal and the act of sharing this information with a co-worker places Margo in violation of the principles of **Privacy and Confidentiality**.

In trying to “promote the good of another” (the principle of **Beneficence**) by seeking advice from a colleague, and in trying to be accountable for one’s own actions, Margo is presented with an ethical dilemma and is in ethical distress as a result of her actions. The CDHA *Code of Ethics* states ethical dilemmas arise “when one or more ethical principles conflict either with other ethical principle(s) or with self-interest(s) and no apparent course of action will satisfy both sides of the dilemma.”⁹ The two key principles in conflict in Margo’s case are **Privacy and Confidentiality** versus **Beneficence**, although **Autonomy** and **Accountability** need to be considered.

If Margo is “experiencing constraints or limitations...which compromise [her] ability to practise in full accordance with...professional principles or standards,”¹⁰ she is then experiencing ethical distress. In her case, she has induced the distress herself by violating Freda’s privacy. Nevertheless, Margo must adhere to practice standards, for example, the CDHA Practice Standard 1. Professional Responsibilities: “Dental hygienists are responsible and accountable for their dental hygiene practice and conduct.”¹¹

At the Ethics Summit I (1998), leaders in education, the military, professional associations, regulatory boards, etc. identified the following three categories of people or reasons why people would be associated with unethical behaviour:¹²

- Incompetent...causing wrong doing
- Impaired...causing wrong doing
- Malevolent ...not incompetent, not impaired...just plain bad

Was Margo in reading the journal being incompetent? Was she impaired (driven by some psychological need to read Freda’s journal)? Or was she behaving in a malevolent way because she was “just plain bad”? Is it possible there could be other reasons for unethical behaviour, reasons not addressed at this summit meeting? Could a person be competent, unimpaired, and non-malevolent and still behave in an unethical manner? Those workshop participants who chose to express themselves did not perceive Margo to be incompetent, impaired, or malevolent. They did view her behaviour in a poor light but could understand how seemingly she kept reading the journal entry after discovering to whom it belonged and what the owner planned to do. It was viewed as an “accidental” discovery and a desire to “do good” despite having to admit to having violated Freda’s privacy.

Many religious doctrines speak of “doing good” and although ethics is not about religious beliefs and practices,¹³ wise principles are in scriptures and/or shared words of many religions and their leaders. There are, for example, the words of His Holiness the Dalai Lama in *Ancient Wisdom, Modern World: Ethics for the New Millennium*.¹⁴

Given our basic premise that an ethical conduct consists in not harming others, it follows that we need to take others’ feelings into consideration, the basis for which is our innate capacity for empathy. And as we transform this capacity into love and compassion through the guarding against those factors which obstruct it and cultivating those conducive to it, so our practice of ethics improves. This, we find, leads to happiness both for ourselves and others.

“You are unique, just like everyone else.” However, as health professionals, we agree to be more like everyone else (within our profession) than uniquely “ourselves.” The CDHA *Practice Standards* set the guidelines, i.e., the “just like everyone else.” The *Practice Standards* clearly state that dental hygienists will practise ethically. We are expected to practise abiding by the laws and regulations governing our profession. In addition, there is an expectation we will not only meet the lowest level of acceptable behaviour (the law) but also practise ethically at a level of behaviour that not only “does no harm” but also promotes “good.”

The privilege of being a health professional

The public endows the dental hygiene profession with their trust and faith in our goodwill to deliver quality care to the best of our ability in our area of expertise. This is a true honour, one that must be upheld, not just by one but by **all** members in the profession. It is inherent in the dental hygienist as a professional to act selflessly because of the intrinsic satisfaction of doing so and the willingness to share our expertise (knowledge and skill) with others.

An investigation into the literature on regulation and licensure of professionals quickly brings the reader to phrases such as “professionals have a calling to...”; “affinity for the work”; and “devotion.”¹⁵ The very fact of being a regulated profession means the public recognizes their own lack of skill and knowledge to effectively protect themselves from unethical and incompetent practitioners and gives the

responsibility to the profession itself. This is a privilege and in honouring this privilege, the dental hygiene community established the CDHA *Code of Ethics*.

Recognizing the need for a code of ethics

There are many different kinds of codes, for example, house alarm codes, family codes, puzzle gram codes, and codes of conduct and of ethics. What all these codes have in common is the element of protection. Some codes, like the family code, are only known to a few people, whereas codes of ethics are often public documents. They are meant to provide guidelines for expected behaviours for the profession and to act as an educational document for the public.

The CDHA *Code of Ethics* is a living document that identifies expected behaviours and defines reasons for the behaviour. It is transparent for all to see, not only the dental hygienist and the public, but for example, other health professions. As a "living document," it is necessary to review and revise it accordingly. In 2002, the CDHA *Code of Ethics* underwent this process and is now published and on the CDHA web site (www.cdha.ca/content/resources/publications_ethics.asp). It was written in accordance with the underlying belief that "dental hygienists believe that oral health is an integral part of a person's overall health, well-being, and quality of life." This belief is pivotal to the principles in the *Code of Ethics*. The fundamental principle for the *Code* states, "The dental hygienist's primary responsibility is to the client, whether the client is an individual or a community."¹⁶

Principles of the CDHA *Code of Ethics* and a decision-making model

There are five main principles articulated in the *Code*: **Beneficence, Autonomy, Privacy and Confidentiality, Accountability, and Professionalism**. Each principle is supported by several standards that help to provide more specific direction for conduct. Compared with the principle, the standards are more precise and prescriptive. Table I outlines the principles and provides samples of the standards of the CDHA *Code of Ethics*. The principles/standards present the "should's and would's." The responsibility to act in accordance with these falls upon each and every dental hygienist ("just like everyone else").

Margo is faced with an ethical dilemma. She must carefully analyze the dilemma to determine the best course of action that first and foremost serves the client's overall health and well-being.

Ethical dilemma decision-making guide

The CDHA *Code of Ethics* offers an "eight-step" procedure or decision-making guide to help resolve ethical dilemmas.

Step I. Identify in a preliminary way the nature of the challenge or problem.

Step II. Become suitably informed and gather information relevant to the challenge or problem, including: factual information; sequence of events; applicable policies, laws or regulations; stakeholders and how they view the situation.

Step III. Clarify and elaborate the challenge or problem based on this information. Identify the principles at stake. Do stakeholders need to be consulted?

Step IV. Identify the various options for action.

Step V. Assess the various options.

Step VI. Decide on and justify/defend a course of action.

Step VII. Implement one's decision as thoughtfully and sensitively as possible.

Step VIII. Assess the consequences of your decision and evaluate the outcome.

Margo needs to work through these steps so she may arrive at a reasonable solution to her ethical dilemma.

Step I. Identify in a preliminary way the nature of the challenge or problem.

Margo realizes that on reading Freda's diary, she inadvertently came across important information affecting the life and death of Freda. However, Margo realizes in reading the diary, she violated Freda's privacy. Now knowing what she knows, Margo seeks the help of a co-worker and in doing so may have violated confidentiality.

Step II. Become suitably informed and gather relevant information.

The following is a sample of "becoming suitably informed and gathering relevant information." Due to the nature of the Margo-Freda case, it would be prudent of Margo to seek the counsel of her regulatory body.

- Freda reveals to Margo during a routine dental hygiene appointment that she recently attempted suicide.
- Freda seemed to be relaxed and cheerful during the appointment.
- Freda leaves her diary with the name, address, and phone number of her psychologist.
- Margo opens the diary to identify the owner.
- Margo reads an entry that indicates Freda is planning another suicide attempt on the weekend when her roommate is away.
- Margo informs a co-worker that she discovered this information while reading Freda's diary.
- Suicide is a violation of criminal law.
- Persons attempting suicide may "cry for help." Did Freda leave the diary on purpose, hoping it would be read and in this way she could appeal for help indirectly?
- Freda has attempted suicide before, freely shared this with Margo, and is under the care of a psychologist.
- Margo shared this information with her co-worker. Why? Was she seeking help for herself? It is possible that Margo shared this information because she was feeling overwhelmed by it and needed help in clarifying the best course of action.
- Suicide counselling and/or intervention is not within the scope of practice of dental hygiene, nor are they within the scope of practice of dentistry. Legal counsel may be advised as may be ethical counsel. The "greater good" for

Principle	Samples of statements of standards
Beneficence Beneficence involves caring about and acting to promote the good of another. Dental hygienists use their knowledge and skills to assist clients to achieve and maintain optimal oral health and to promote fair and reasonable access to quality oral health services.	Dental hygienists: • provide services to their clients with respect for their individual needs and values and life circumstances • seek to improve the quality of care and advance knowledge of oral health through such activities as quality assurance, research, education, and advocacy in the public arena
Autonomy Autonomy pertains to the right to make one's own choices. By communicating relevant information openly and truthfully, dental hygienists assist clients to make informed choices and to participate actively in achieving and maintaining their optimal oral health.	Dental hygienists: • do not rely upon coercion or manipulative tactics in assisting the client to make informed choices • in the case of clients who lack the capacity for informed choice, actively involve and promote informed choice on the part of the client's substitute decision-makers, involving the client to the extent of the client's capacity
Privacy and Confidentiality PRIVACY pertains to the individual's right to decide the conditions under which others will be permitted access to his or her personal life or information. CONFIDENTIALITY is the duty to hold secret any information acquired in the professional relationship. Dental hygienists respect the privacy of clients and hold in confidence information disclosed to them, subject to certain narrowly defined exceptions.	Dental hygienists: • hold confidential any information acquired in the professional relationship and do not use or disclose it to others without the client's express consent, except: as required by law; ... to the substitute decision-maker of a client • obtain the client's expressed consent to use or share information about the client for the purpose of teaching or research
Accountability Accountability pertains to the acceptance of responsibility for one's actions and omissions in light of relevant principles, standards, laws and regulations and the potential to self-evaluate and to be evaluated accordingly. Dental hygienists practise competently in conformity with relevant principles, standards, laws and regulations, and accept responsibility for their behaviour and decisions in the professional context.	Dental hygienists: • take appropriate action to ensure first and foremost the client's safety and quality of care when they suspect unethical or incompetent care • practise within the bounds of their competence, scope of practice, personal and/or professional limitations, and refer clients requiring care outside these bounds
Professionalism Professionalism is the commitment to use and advance the professional knowledge and skills to serve the client and the public good. Dental hygienists express their professional commitment individually in their practice and communally through their professional associations and regulatory bodies.	Dental hygienists: • participate in professional activities...to promote oral health • participate in mentoring, education, and dissemination of knowledge and skills in oral health care • collaborate with colleagues ... toward the primary end of providing safe, competent, fair, quality care to clients

Table I. CDHA ethical principles and standards

Freda appears to be to somehow intervene in her planned suicide attempt; how to intervene is the issue Margo must work through.

- The regulation of dental hygiene in the province in which Margo practises is a consideration. Is her practice governed by an act requiring direct supervision? If so, does the supervising dentist need to be consulted and/or informed about her discovery?
- Does Margo's workplace have a policy on managing confidential and private information considered to be life threatening to the client? Are clients informed about this policy?
- What are the laws surrounding suicide intervention?
- What guidance does Margo's regulatory body give her regarding options for actions?

Step III. Clarify and elaborate the problem based on the additional information. Identify the ethical principles at stake.

What ethical principles are at stake? What ethical principles are in conflict? In this case, **Beneficence** (acting to promote the good of another) appears to be in conflict with **Autonomy** (the right to make one's own choices) and **Privacy and Confidentiality** (respect the privacy of clients and hold in confidence information disclosed to them). **Accountability** is relevant to this case in that Margo must accept responsibility for her behaviour and choices in the professional context and so must the co-worker, since she is now aware of the situation.

The CDHA *Code of Ethics*' standards for each principle involved with this case provide guidance for resolving Margo's dilemma. Consider one of the standards associated with the principle of **Beneficence**: "1d. Put the needs, values, and interests of their clients first and avoid exploiting their clients for personal gain." Since beneficence means "caring about and acting to promote the good of another," it appears Margo needs to take some action to help prevent a possible suicide. **Autonomy** pertains to the right to make one's own

choices. In the *Code of Ethics*, it refers to informed consent regarding choices for oral health care. Looking at the Margo-Freda case in a broader context, in order to respect the client's autonomy, it is necessary for Margo to truthfully disclose to Freda what she now knows and how she derived the information. Does Margo first need to consult the expert, Freda's psychologist, for advice?

The standards for the principle of **Privacy and Confidentiality** give more guidance to Margo. For example, "3b. Hold confidential any information acquired in the professional relationship and do not use or disclose it to others without the client's express consent, except: 3b.i. as required by law; 3b.ii. as required by the policy of the practice environment; and 3b.iii. in an emergency situation." Margo needs to take Freda's diary entry seriously as it is a "life or death" situation. It is fair to say it constitutes "an emergency" and key individuals should be advised, for example, the psychologist who is treating Freda. In addition, if Freda is a patient of record of a dentist/employer, then the dentist may need to be advised of the situation.

Regarding the principle of **Accountability**, the standards guide Margo to be responsible for her actions and omissions with respect to practice standards, laws, and regulations. Standard 4d. ("practise within the bounds of their competence, scope of practice, personal and/or professional limitations, and refer clients requiring care outside of these bounds") directs Margo to contact the psychologist in order to promote Freda's health and safety.

Step IV. Identify the various options for action.

For Margo, there is a variety of possible courses of action, for example:

- doing nothing;
- discussing it with the dentist/employer (if applicable);
- further discussing it with her co-worker;
- presenting the dilemma to her regulatory body for advice;
- contacting Freda herself and offering to help her;
- calling Freda's roommate; and
- directly informing the psychologist.

Margo needs to carefully consider the various courses of action.

Step V. Assess the various options.

Margo, after identifying the various options for action, must weigh the pros and cons of each action. This process helps to sort the options and better align them for selection purposes. Here are only a few attempts to assess the various options:

- If Margo does nothing, there is potential for great harm to come to Freda, but Margo need not worry about others knowing about her violation of Freda's privacy.
- If practice regulations require Margo to confide in the dentist/employer, then the dentist/employer must decide on the best course of action. Margo could possibly find herself unemployed due to the disclosure of violating the principle of Privacy. Given that Margo's actions were not

malicious, this is not likely and if by doing so, she prevents Freda from committing suicide, the action may have justified the means—thus the argument that the Margo-Freda case would benefit from counsel with a lawyer, an ethicist, and a community of peers (regulatory body and professional association).

- Margo could call Freda, tell her truthfully what has happened, and ask Freda what course of action she would like Margo to take. This respects Freda's autonomy but may not promote "good" for Freda if she tells Margo not to tell anyone and that she has the right to make her own decisions about her life. Suicide is illegal. A person does not have the right to take his or her own life.
- Margo could call Freda's roommate and advise the roommate of the possibility of a suicide attempt by Freda over the weekend. Since we know nothing of the relationship between Freda and her roommate, this could be a risky thing to do and it further violates the confidentiality issue.
- Margo could call Freda's psychologist, explain the circumstances as truthfully and completely as possible to allow the psychologist who has been educated to handle these situations to intervene in the best possible way. The immediacy of the situation may dictate this as the most expedient course of action with the greatest good in that Freda's psychologist would be aware of her state of mind. The psychologist would assume responsibility within his or her scope of practice.

Step VI. Decide on and justify/defend a course of action.

Margo must decide on a course of action and be able to justify her decision in accordance with applicable policy, law, or regulation. Is there one clear decision? Returning to the workshop, there was no one clear accepted course of action expressed uniformly by the participants. Some participants said that the policy, law, and/or regulations by which they practise would require them to truthfully and completely disclose the information to their dentist/employer. They thought Freda is a "patient of record" to the dentist and as such, the dentist also has a responsibility to this client and needs to be advised of the situation. Other participants said they would directly contact the psychologist and not further involve other persons to protect Freda's privacy and autonomy and that they were accountable for their own actions. Consulting the regulatory body was deemed most appropriate.

Freda's autonomy and privacy were violated by Margo reading Freda's diary. After considering the issues at stake—the principles involved, the pros and cons of the various courses of action—workshop participants did say it was important for Margo to try to avert a potential suicide. As a client advocate, Margo must ensure Freda receives expert help as the situation was outside the scope of dental hygiene practice and most importantly, Freda's health and well-being must be upheld above all else. Margo needs to take appropriate action to help prevent the suicide. Whether Margo contacts the psychologist or her employer does, it was generally agreed that the psychologist should be directly involved as the expert. This became the justified course of action.

Step VII. Implement one's decision as thoughtfully and sensitively as possible.

Margo, in contacting Freda's psychologist, did so believing Freda left the diary on purpose in the hope that someone would intervene on her behalf. Margo's intentions were to ensure Freda's safety, in this case, from Freda herself. Margo, in being accountable for her actions, would have to apologize to her co-worker for inappropriately disclosing the case and causing distress, explaining that she was shocked by what she had read in the diary and felt the need to confide in a trustworthy person. To Freda, she owes an apology for continuing to read her diary and should admit that she violated Freda's privacy. What actions Freda chooses to take due to this violation of trust will have to be managed by Margo who must be accountable for her actions.

Step VIII. Assess the consequences of your decision and evaluate the outcome.

Just as in all other aspects of dental hygiene practice, Margo must evaluate the outcome of her care. She needs to assess the consequences of her decision. Did her actions turn out as hoped, that is, did Freda receive help? If found in the same situation, would Margo conduct herself differently—perhaps choosing not to read a diary—or is she glad she did because the result was in the end helpful to Freda? Is Margo sensitized to the principle of confidentiality? Will she choose more carefully the person with whom she discusses cases and consider why she is discussing the case? Is it for advice or consultation, or other reasons? The evaluation step provides Margo with the assurance that even if others do not agree with her choice of actions, she knows she behaved in a responsible manner to try and respond to the ethical dilemma. There is not always one clear-cut answer, but arriving at a decision about the course of action after carefully analyzing the issues, principles, and actions assures the dental hygienist acted responsibly.

Summary

The CDHA *Code of Ethics* outlines the principles and respective standards and offers a guideline for resolving ethical dilemmas. The Margo-Freda case is a complex one. Many ethical dilemmas are much less involved; some are more so. Key to the dental hygienist's continuing competence to practice in an ethical manner and deal with ethical dilemmas is the recognition of violation of ethical principles, knowledge and application of the standards, and the ability to thoughtfully and sensitively proceed through a ethical dilemma decision-making process to arrive at an action in accordance with practice standards/principles, law, and regulations.

In the Margo-Freda case, as in most ethical dilemmas, there is no perfect or ideal choice. There appear to be more reasons than just incompetence, impairment, or malevolence for why people are associated with unethical behaviour, as suggested at the Ethics Summit I in 1998. Does Margo fall under the categories of incompetence, impairment, or malevolence? She did engage in an unethical activity by reading the diary but to label her as "an unethical person" may be a harsh and unjust judgment. There is the possibility that Freda's life could be saved as a result of Margo's reading the diary and taking a responsible action on behalf of Freda.

Nothing is strictly black and white in these cases. It is possible for poor or unethical choices to have a positive outcome and good or ethical choices to have a negative outcome. What could have happened to Freda if Margo had not read the diary? If Margo's subsequent actions are guided by compassion and empathy and if Margo's intention is to take action to help prevent a tragic outcome, then ultimately Margo's actions could be viewed as "ethical."

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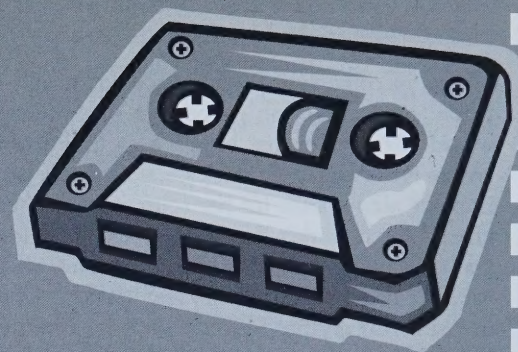


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An Enhanced Screening and Referral Program

A Community Dental Hygiene Pilot Project

by Dianne Chalmers,* RDH, BSc

Abstract

In the Capital Health District of Nova Scotia, from 1997 to 2001, public health dental hygienists conducted school dental screenings in all elementary schools in the district. While the primary purpose was to identify schools with high-risk students eligible for the Fluoride Mouth Rinse Program, the oral health data gathered during the screenings was also used to assist with planning other targeted dental public health strategies. A review of the data revealed that, in spite of universal access to a publicly financed Children's Oral Health Program (COHP) for children in Nova Scotia from birth to 10 years of age, many schools in the Capital Health district had a high percentage of students with untreated decay as well as many students who had not visited the dentist for an examination in the last 12 months. To address this issue, a pilot project called An Enhanced Screening and Referral Program was developed and delivered to a school with a history of high levels of untreated decay. The purpose of the program was to get more children to the dentist before the age of 10 (cut-off age for the COHP). The public health dental hygienists in the Capital Health District made several modifications to the way the Capital Health District dental screening clinics are conducted. In June 2001, public health dental hygienists screened 157 students in grades primary to four. Results showed that 66 per cent had not visited the dentist for an examination in the last 12 months and 33 per cent had untreated decay. The evaluation clinic was held in March 2002. While the results of the evaluation indicated a drop in the percentage of students with untreated decay and an increase in the percentage of students who had an examination with a dentist, it also raised questions for further



research in the areas of disparities in oral health, barriers to care, and community capacity building.

Background

The Nova Scotia Oral Health Survey of Children and Adolescents (1995–1996) found that over 50 per cent of grade one students in Nova Scotia had a history of dental decay.¹ In the Capital Health District of Nova Scotia, the largest health district in the province, the data gathered by public health dental hygienists showed that between 52 per cent and 100 per cent of grade two students in many schools had a history of untreated decay. Between 53 per cent and 88 per cent of grade two students had an examination with a dentist in the past 12 months. In the March 2001 *Journal of the American Dental Association*, the principal investigator of the Nova Scotia Oral Health Survey of Children and Adolescents (1995–1996), Dr. Amid Ismail, stated that having access to a universal publicly financed dental insurance program since birth did not eliminate the disparities in caries experience in children living in Nova Scotia.² Children whose parents had a higher education level had a significantly lower mean number of decayed, missing, and filled surfaces (dmfs) in their primary teeth than did children whose parents had a lower education level. In addition, optimal fluoride concentration in schools' water supplies, daily tooth brushing, and dental visits for checkup were significantly associated with low dmfs scores.

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Objectives

- ♣ Decrease by 15-20% the percentage of children with untreated decay
- ♣ Increase by 15-20% the percentage of children with annual dental exam

Public Health dental hygienists developed an Enhanced Screening and Referral Program aimed at improving the oral health of children in a low socio-economic area by attempting to impact on some of the barriers to dental care. The program strategy was designed to get more children to the dentist for examination and treatment before the 10-year-old cut-off age in the publicly financed Children's Oral Health Program (COHP). The school chosen for the Enhanced Screening and Referral Program was located in a low socio-economic area where existing records indicated students had a history of high levels of untreated decay.

Project description

The Enhanced Screening and Referral Program began in June 2001 and had the following two objectives: (1) by June 2002 the percentage of students with untreated decay would decrease by 15–20 per cent, and (2) the percentage of students who receive an annual examination with a dentist would increase by 15 to 20 per cent. The target population included all students in grades primary to grade four in 2001 ($n=157$) and all students in grades 1 to 5 in 2002 ($n=152$). Only students with signed parental consent were able to participate. In June 2001, public health dental hygienists held the first screening clinic. Students with untreated decay and those who had not seen a dentist for an examination in the past 12 months were referred to the community dentists. Parents were notified of the findings and referral. In March 2002, the evaluation clinic was held. The students who were seen in 2001 and returned in 2002 for evaluation were separated out and became the study group. This group ($n=105$) was evaluated for results by screening and matching each student with his or her previous year's findings.

Several modifications were made to the way dental screenings are usually conducted in the Capital Health District in order to raise awareness of children's oral health and to ensure a high participation rate in the project. Public health dental hygienists also increased the amount of time normally spent in the school. Two weeks before the school screening was held, dental hygienists visited the school on several occasions. A meeting was held with the principal, teachers were informed of the project, and the screening consents were distributed. The dental hygienists also made frequent visits to the classrooms to collect the forms, to remind students to

return them, and offer incentives for participating in the screening.

The forms used in dental screenings were revised. Consent forms were brightly coloured to make them more noticeable to teachers, students, and parents. A new screening result form for parents was developed. It was designed to inform parents of their child's oral health status and need for referral, if appropriate. A paragraph was inserted at the bottom of the page to remind parents of the cut-off age for COHP, a publicly financed universal oral health program for children in Nova Scotia from birth to age 10. Parents were also given a separate detailed fact sheet on the COHP. Follow-up phone calls were made to parents whose children needed immediate treatment. Details of the COHP were explained and in some cases dental hygienists assisted parents with booking dental appointments.

Methods

Dental screenings were conducted in the school by six dental hygienists. One hygienist was the primary screener and all others were calibrated to her. For the purposes of this report, untreated decay is defined as the presence of observable dental caries. At both screening clinics, students with untreated decay and those who had not seen a dentist for an examination in the past 12 months were referred to the community dentists. Students were each given a screening result form and a COHP fact sheet to take home to their parents. Data were tabulated according to the percentage of students with untreated decay and the percentage of students who had received an examination with a dentist in the past 12 months.

Screening results for all students

Table 1 shows the results from both years of the program. The number of children who were screened with parental consent in both years was fairly consistent (73 per cent and 70 per cent). The percentage of students with untreated decay dropped from 33 per cent in 2001 to 27 per cent in 2002 while the percentage of students who had received an examination with a dentist in the past 12 months increased from 66 per cent in 2001 to 70 per cent in 2002. Note that the population in both years was not consistent. Many students seen in the first year did not return in 2002 and many new students were seen for the first time in 2002.

Year	2001	2002
Grades	P-4	1-5
Number of students eligible	215	219
Number of students screened	157 (73%)	152 (70%)
Percentage of students with untreated decay	33%	27%
Percentage of students who received an examination with a dentist in the past 12 months	66%	70%

Table 1. Screening results from 2001 and 2002, all students screened

Screening results for study group

In order to provide a more reliable evaluation result, students who were screened in 2001 and returned in 2002 were separated out and studied. This study group consisted of 105 students. The results are shown in Table 2. Twenty-nine per cent of the students from this group had untreated decay in June 2001. In March 2002, 13 per cent of the students from this group had untreated decay. The percentage of students in the study group with untreated decay dropped from 29 per cent to 13 per cent. Results for annual dental examination showed that 71 per cent of the students from the study group in June 2001 had received an examination with a dentist within the past 12 months. In March 2002, 83 per cent of the students from this group had received an examination with a dentist within the past 12 months.

Year	2001	2002
Grades	P-4	1-5
Number of students screened in study group	105	105
Percentage of students with untreated decay	29%	13%
Percentage of students who received an examination with a dentist in the past 12 months	71%	83%

Table 2. Screening results from 2001 and 2002, study group

Discussion

It is interesting to note that the percentage of untreated decay in June 2001 is in keeping with the data recorded from previous screenings. In 1995 and 1998, 37 per cent of the students in this school had untreated decay. Approximately one third of the students in this school normally have untreated decay. The whole population results in Table 1 show a small drop in untreated decay, compared with the results from the study group in Table 2. The study group results represent a more reliable result because the students seen in 2002 were matched exactly with their 2001 records. For instance, students with untreated decay in 2001 were examined in 2002 to see if the teeth had been treated.

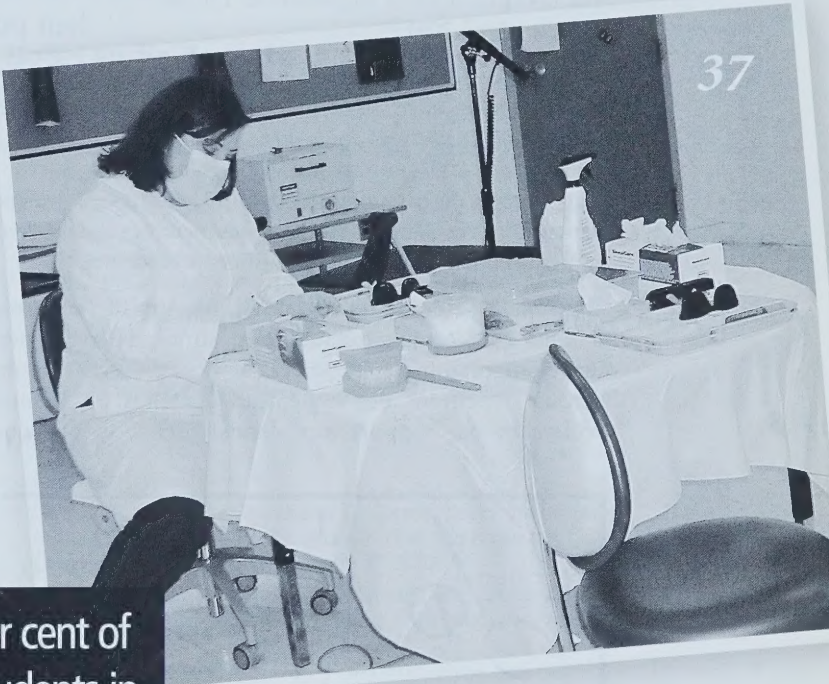
Results for annual dental exam—recorded in both tables—were less dependable because the evaluation clinic was held fewer than 12 months after the first clinic in 2001. It should also be noted that parents' self-reporting for annual dental exam allows for inaccuracies.

This project is ongoing and has recently been expanded to three other schools in the same geographic area. Negotiations are now under way now with Dalhousie University Faculty of Dentistry to arrange for treatment of the students after they have been screened and referred by the public health dental hygienists. The community

health board in the area has offered assistance with this project and may be able to arrange transportation for the students to the Dalhousie Dental clinic.

Conclusions

The data from the study group suggests that the Enhanced Screening and Referral Program had an impact on increasing the number of children using the Children's Oral Health Program, thereby improving the oral health of these students. However, it is recognized that other factors could have contributed to the outcome. The results of the school dental screenings in this geographical area raise questions for further research in the areas of disparities in oral health, barriers to care, and community capacity building.



"Over 50 per cent of grade one students in Nova Scotia had a history of dental decay."

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L'étude *Health Manpower Inventory* (1976), de Santé Canada, estimait qu'il y avait 211 hygiénistes dentaires au Canada en 1965. Trente-six ans plus tard, en 2001, ce nombre avait augmenté de façon dramatique, pour atteindre 13 834.³ Pendant cette même période, le rapport des hygiénistes dentaires à la population est également tombé de façon tout aussi dramatique, de 1:16 637, en 1968, à 1:2 240, en 2001.⁴ En l'absence d'une augmentation correspondante du nombre de dentistes, le rapport des hygiénistes dentaires actives aux dentistes actifs a augmenté de 1:5, en 1977, à 1:1, en 2001.⁵

Le profil de la main-d'œuvre en hygiène dentaire qu'on vient de compléter dans la publication *La pratique de l'hygiène dentaire au Canada, 2001* montre un faible taux d'attrition et un bassin inactif réduit. L'effectif de l'hygiène dentaire est très stable, la moitié de ses membres restant dans le même emploi pendant les 10 années précédentes.⁶

Toutefois, une étude récente de l'University of California indique que, lorsqu'on étudie les pénuries, des renseignements importants concernant les services préventifs seront perdus si l'effectif des hygiénistes dentaires est mesuré seulement par rapport aux dentistes et à la pratique

Les annonces
de postes
d'équivalents
temps plein en
hygiène dentaire,
sont tombées à
leur point le plus
bas en 21 ans.

dentaire.⁷ Le même examen critique parle renvoie à la nécessité d'examiner des indicateurs de besoins cliniques non satisfaits lorsqu'on considère les définitions de pénurie, et de ne pas se concentrer nos observations exclusivement sur les rapports entre les pourvoyeurs traditionnels comme indicateurs de pénurie des soins de santé bucco-dentaire.

Il y a une différence entre la demande et les besoins qui existent dans la population. Il y a une différence entre les attentes professionnelles et les attentes du public. Il y a des différences dans la rémunération à travers le pays et au sein des différents milieux de pratique. À travers toutes les juridictions présentes au Canada, on trouve des domaines de pratiques changeants et des exigences réglementaires différentes.

Mais toute discussion d'une pénurie perçue doit se pencher sur l'enseignement professionnel. L'éducation des profes-

sionnels de la santé a dû faire face aux défis que posaient (1) la faiblesse du soutien professionnel, qui a entraîné des frais de scolarité plus élevés, et (2) la crainte, au début des années 90, d'une offre excédentaire dans les professions de la santé, qui a mené à réduire de nombreux programmes de professionnels de la santé. L'hygiène dentaire est allée à l'encontre de ces tendances nationales spécifiques : "Entre 1988 et 2000, les diplômés en thérapie physique, en ergothérapie et en hygiène dentaire ont augmenté, alors que les nombres enregistrés en médecine et en dentisterie diminuaient."⁸ Toutefois, le domaine des soins de santé en général est devenu un choix de carrière moins désirable pour la jeunesse du pays, qui croit peut-être que les autres domaines, comme la haute technologie, peuvent offrir une carrière plus rémunératrice. Les programmes d'enseignement sont souvent hors d'accès pour les populations qui en ont besoin. Par exemple, les peuples autochtones, qui ont de grands besoins en soins de santé, peuvent devoir s'éloigner de chez eux et s'adapter à une culture différente dans le but d'acquérir leur éducation pour ensuite retourner chez eux, dans leurs milieux communautaires. Ces problèmes de ressources humaines en santé, communs à la plupart des professions de la santé au Canada, ont un impact sur l'accès à des soins et sur les résultats des soins de santé.

Le vieillissement de la population, les progrès de la technologie et l'accroissement des populations de clients ayant des problèmes de santé compromettants et dégénérateurs ont exercé une très forte pression sur les programmes de diplôme en hygiène dentaire. Une quantité importante de contenu essentiel supplémentaire et été incluse dans le programme d'études au cours des quelques dernières années et ce dernier est surchargé. La pratique de l'hygiène dentaire et de la dentisterie fondées sur la preuve exige que les praticiens se tiennent au courant de toutes les découvertes de la recherche actuelle. Ces découvertes amènent une expansion des programmes d'enseignement et font de l'éducation continue une obligation dans la plupart



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des juridictions. Les nouveaux domaines d'étude comprennent les soins de clients avec implants et de personnes ayant des besoins exceptionnels, les personnes vieillissantes, la recherche actuelle et le counselling sur l'usage du tabac, l'usage du tabac et la résorption osseuse, le contrôle de la douleur, de la peur et de l'anxiété, pour n'en mentionner que quelques-unes. Plus récemment, l'impact de la périodontie sur les bébés de faible poids à la naissance et la maladie systémique a significativement affecté le rôle des professionnels dentaires, particulièrement ceux et celles qui font la plus grande partie de l'éducation préventive et de la promotion de la santé, c'est-à-dire les hygiénistes dentaires. Le besoin d'expansion des programmes d'enseignement actuels au niveau du diplôme de baccalauréat est évident. La profondeur et l'ampleur de l'enseignement offert dans un programme de diplôme permet de préparer des diplômés qui peuvent répondre aux besoins des Canadiennes et des Canadiens en matière de soins de santé, maintenant et dans l'avenir.

Les pénuries sont affectées par le recrutement et la rétention, et non pas par la durée de la préparation initiale sur les bancs de l'école. Les diplômes de baccalauréat sont attrayants pour les étudiants en puissance et la possibilité de pouvoir poursuivre leurs études au niveau supérieur est un facteur qui aide au recrutement.

Le recrutement des hygiénistes dentaires est une chose ; les retenir en est une autre, qui a rapport aux conditions de travail, au salaire et aux rémunérations, et aux avantages sociaux. Les dentistes, comme groupe d'employeurs, mentionnent souvent qu'ils trouvent que les émoluments des hygiénistes dentaires sont relativement élevés. Mais il a été montré que l'ensemble de rémunération de 90 pour cent des hygiénistes dentaires, en 2001, consistait en salaires seulement, sans avantages sociaux. Des comparaisons intersectorielles portant sur des professions semblables suggèrent que les gains des hygiénistes dentaires devraient être ajustés "à la baisse par un facteur d'au moins 10 % pour compenser l'absence d'avantages sociaux."⁹

Nous attendons avec impatience de pouvoir analyser, dès le début de la nouvelle année, les réponses données à l'enquête sur la main-d'œuvre de l'ACHD, à laquelle nombre d'entre vous ont participé, et de vous faire rapport du sentiment des hygiénistes dentaires vis-à-vis leurs situations d'emploi.

L'ACHD est l'un des cinq partenaires dans un projet proposé d'Étude du secteur des soins de santé bucco-dentaire qui aurait pour but d'évaluer les besoins de ressources humaines en santé bucco-dentaire. Cette étude inclut la validation des projections et des données permettant de prévoir avec exactitude les ressources humaines nécessaires pour créer un plan à long terme global pour l'effectif de la santé buccale. Nous anticipons avec plaisir de participer activement à ce projet national pour nous assurer que nous disposons de données exactes qui nous permettront de prendre des décisions informées.

Notes en fin de texte

1. Ward, Thomas F.: Scarcity of health human resources: a chronic national disease. *HealthcarePapers* 3(2): p. 71, 2002
2. British Columbia Dental Hygienists' Association: Employment Opportunities Line Statistics. November, 2002
3. Canada. Health and Welfare Canada: Canada health manpower inventory 1976. The practice of dental hygiene in Canada: description, guidelines and recommendations. Part One. Ottawa: Health and Welfare Canada, 1988. Cat. No. H34-33/1-1988E. In: Johnson, P.M. Dental hygiene practice in Canada 2001. Report No. 3: Findings. Ottawa: CDHA, p. 380, 2002
4. Canada. Health and Welfare Canada: Health personnel in Canada. Ottawa: Supply and Services Canada, 1991. Catalogue No. H1-9/1-1991. In: Johnson, op cit.
5. Johnson: p. 380
6. Johnson: p. 393
7. Orlans, J., Mertz, E., Grumbach, K.: Dental health professional shortage area methodology: a critical review. San Francisco: UCSF Center for the Health Professions, p. 27, 2002
8. Alvarez, R., Zelmer, J., Leeb, K.: Planning for Canada's health workforce: looking back, looking forward. *HealthcarePapers* 3(2): p. 16, 2002
9. Johnson: p. 394 

"PERSPECTIVES ON THE 13TH ANNUAL CDHA PROFESSIONAL CONFERENCE" (continued from page 11)

each conference. This way, they can revisit what seems like a dream once they return to their comfortable corners of this vast and wonderful country.

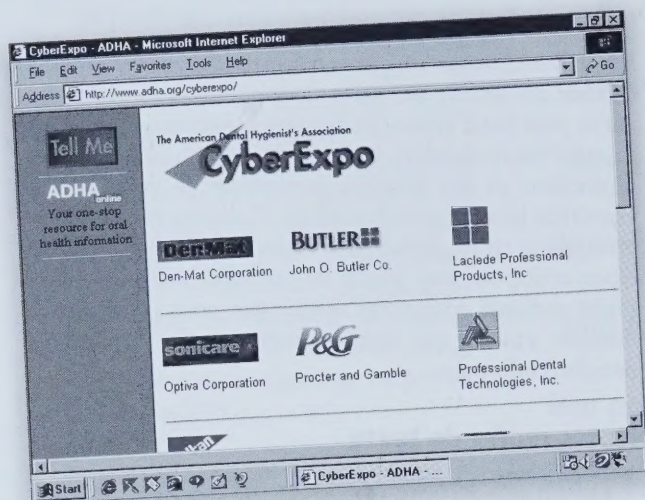
The trade exhibition is always a big attraction at the CDHA conferences and this year was no exception. All exhibitors were friendly, well informed, helpful, and willing not only to discuss their products but also to generously provide samples. Their positive comments about the calibre of our conference—for dental hygienists by dental hygienists—indicate that the dental industry is definitely aware of the vital role that dental hygiene professionals play in the marketplace. The CDHA president, Barb Gibb, presented each exhibitor with a beautiful etched glass memento as a token of CDHA's appreciation of their active participation in its 13th annual conference.

The Maritime Kitchen Party, featuring local fiddler Ivan Hicks and comedian Jimmy The Janitor (Sandy Gillis), provided an opportunity for the delegates to experience our true

Maritime hospitality with lots of laughing, toe-tapping, and dancing. Friendships were formed, professional contacts developed, and lots of interprovincial networking took place.

The Delta Beauséjour convention site is well located in the city centre along the Petitcodiac River where the world-famous tidal bore rides up from the Bay of Fundy every 12 hours. The weather was absolutely superb, making the variety of dining and shopping establishments an easy and pleasant walk away.

On behalf of the NBDHA organizing committee, we would like to thank everyone for coming to New Brunswick from September 20 to 22, 2002. The volunteers emerged feeling somewhat humbled and extremely proud of what our great dental hygiene profession has brought not only to us individually, but also to the province of New Brunswick. Thank you all, and do come again. 



by Karen Wolf, DipDH

It is hard to believe that we are in the middle of our Canadian winter and that the holiday season is behind us, but our parkas and gloves tell the true story. This year at our CDHA Conference in Moncton ("Ride the Tide to Professional Pride"), collaboration, communication, and collegial interactions were just a few of the themes throughout the event.

PRODUCTS AND INFORMATION

CyberExpo — American Dental Hygienists' Association (ADHA)
(www.adha.org/cyberexpo/)

For both those who enjoyed the exhibits and those who were unable to attend, check out the *CyberExpo* section of the ADHA web site where you can experience a virtual exhibit with a wide variety of dental manufacturers and companies. It is "your one-stop resource for oral health information" with companies such as Den-Mat Corporation, John O. Butler Co., Procter and Gamble, Young Dental Manufacturing, Braun Oral-B, Colgate, Sensodyne — GlaxoSmithKline, Continuing Education for Dental Professionals, 3M ESPE, and more.

CURRENT EVENTS

Canadian Association of Public Health Dentistry — Brief to the Romanow Commission
(www.caphd-acsd.org/news.html)

The recent report by Commissioner Roy Romanow highlighted a new health human resources strategy, an investment in applied research, additional funding for health in rural and remote areas, and the creation of Aboriginal Health Partnerships.

"Dental public health is concerned with the diagnosis, prevention and control of dental diseases, and the promotion of oral health through organized community efforts. Rather

than the individual, dental public health serves the community as the patient, through research, health promotion, education and the administration of group dental care programs." This quote comes from page 4 of the CAPHD's brief to the Romanow Commission. Take few minutes to read the whole paper.

Oral Health of Seniors Project — Dalhousie University (www.medicine.dal.ca/ahprc/oralhealth)

We know that several factors, including continued use of fluoride in our drinking water and increased awareness about proper dental health, have led to a growing number of seniors keeping their teeth for life. However, we don't know if existing health services can continue to meet the needs of seniors. "It's an important issue. Oral health substantially affects overall health and quality of life," says Dr. Mary McNally, co-principal investigator of the Oral Health of Seniors project at Dalhousie University and a member of the same university's Faculty of Dentistry. This issue has been called the "silent epidemic" among many organizations. For example, "75 percent of senior men and 83 percent of senior women in Canada do not have dental insurance. With more than 13 percent of Nova Scotia's population over the age of 65 and often living in rural areas, the need for an evaluation of oral health services and development of an effective health services model is critical," notes Dr. McNally. Improved access to oral health care will ultimately affect seniors' general well-being and overall health. The project team includes decision-makers from Dalhousie University, University of Toronto, Manulife Financial, Nova Scotia Dental Association, Nova Scotia Senior Citizens' Secretariat, Nova Scotia Dental Hygienists' Association, and Northwoodcare Inc. For more details, check out the project's web site.

RESEARCH REVIEWS

Cochrane Oral Health Group, abstracts of reviews
(www.update-software.com/ccweb/cochrane/revabstr/g080index.htm)

The Cochrane Oral Health Group is a respected collection of research papers on a wide variety of subjects. The abstracts of Cochrane Reviews can be browsed or searched at no charge.

Some of the reviews you will find here are:

- Fluoride gels for preventing dental caries in children and adolescents
- Fluoride varnishes for preventing dental caries in children and adolescents
- Guided tissue regeneration for periodontal infra-bony defects
- Interventions for preventing oral mucositis or oral candidiasis for patients with cancer receiving chemotherapy

Until next time....



Ride the Tide to Professional Pride

13th Annual Professional Conference
September 20-22, 2002
Moncton, New Brunswick

Ensemble, Soyons fiers(e)s de notre profession

13^e conférence annuelle professionnelle
Du 20-22 septembre, 2002
Moncton (Nouveau-Brunswick)

An annual conference requires significant planning. For over a year, a dedicated and enthusiastic group of volunteers spent hours of their personal time organizing every last detail of the CDHA's 13th Annual Professional Conference last September, hosted in Moncton, New Brunswick. Led by Mary Pelletier and Sharyn Milroy, the conference co-chairs, the individuals listed below met on a regular basis to organize speakers, local sponsors, door prizes, delegate bags...the list goes on and on. These volunteers also played a key role behind the scenes at the conference itself. They calmly and coolly dealt with any challenge that was thrown their way, even when half the delegate badges were discovered to be missing due to a courier delivery error! And all with a smile and the East Coast hospitality so many of us experienced during our time in Moncton.

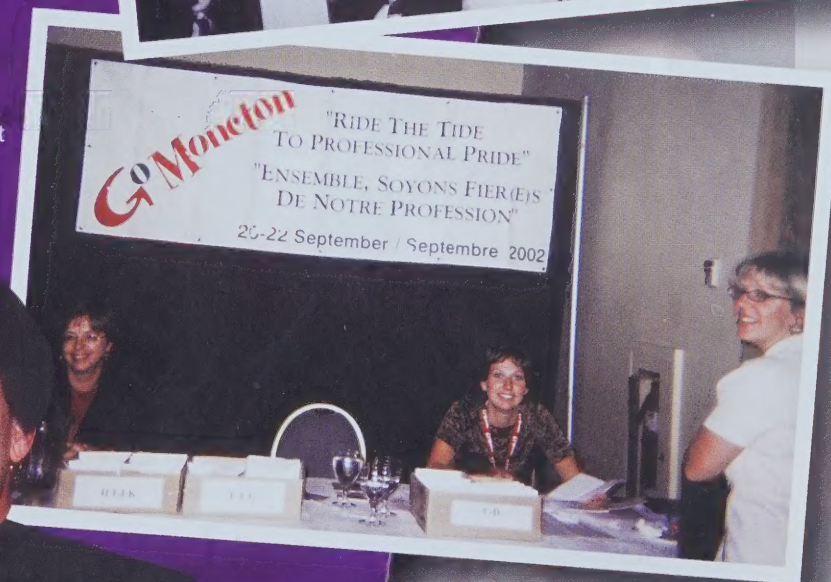
On behalf of the CDHA and all of the delegates who attended the 13th Annual Professional Conference, we wish to thank you all for your unwavering dedication to your profession and your national association. You are the reason that conference attendees returned home feeling re-energized and with a renewed sense of pride in their profession!

Members of the Moncton Volunteer Committee:

Nicole Arsenault
Andrea Booth
France Bourque
Nathalie Brisson
Pamela Bryson-Weaver
Anne Comeau

Tracey Dunnett
Trudy McAvity
Barb McCain
Emma McPhee
Sharyn Milroy
Tracy O'Blenes
Darlene Paturel

Mary Pelletier
Chris Robb
Denise Rouse
Kelly Smith
Christine Thériault
Diane Thériault



Barb Gibb and Cindy Sensabaugh (Crest).

CONFERENCE REVIEW

Above Top: (l. to r.) Mary Pelletier, Trudy McAvity, Cara Tax and Mickey Wener. Above Bottom: (l. to r.) Emma McPhee, Christine Thériault and Diane Thériault.

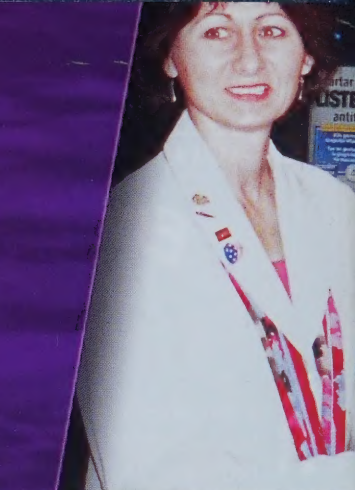


Ride the Tide to Professional Pride

13th Annual Professional Conference
September 20-22, 2002
Moncton, New Brunswick

Ensemble, soyons fiers de notre profession

13^e conférence annuelle professionnelle
Du 20-22 septembre, 2002
Moncton (Nouveau-Brunswick)



CONFERENCE REVIEW



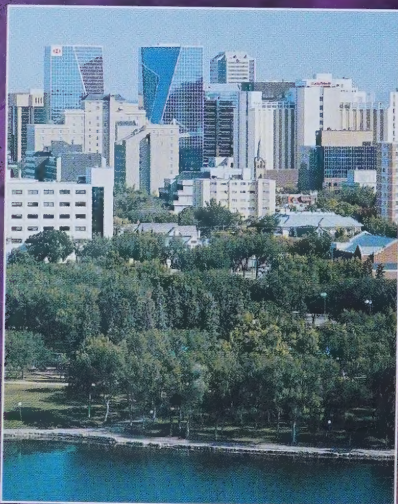
Dates:
June 20-22, 2003
Location:
Regina,
Saskatchewan



44

Expanding Horizons

14th Annual Professional Conference
Regina, Saskatchewan
June 20-22, 2003



Regina, the capital city of Saskatchewan, is the heartbeat of the province. Founded in 1882, Regina was once home to the Plains Indians. Over the years, the city has grown and prospered, evolving from a quiet farming town in the settlement years to a modern and cosmopolitan centre of business, industry, and government. Come to Regina and discover this oasis on the Prairies. For more information about the city and all that it has to offer, visit www.tourismregina.com.

The 14th Annual Professional conference will be hosted at the Regina Inn Hotel and Conference Centre, a city landmark since 1967 and Regina's premier hotel. Located in the heart of the business and financial district, the Regina Inn is only minutes away from Wascana Park and the Cornwall Centre, the city's largest shopping centre. With the recent multi-million dollar renovation, the Regina Inn offers modern facilities with professional, friendly service. For a virtual tour, visit www.reginainn.com. To make room reservations, call toll free 1-800-667-8162 and ask for the CDHA Conference rate. Rooms will be available at the conference rate until **May 19, 2003**.



Wish to book your flight now? Call Uniglobe Travel at 1-800-267-9372, ext.420, and quote our convention number (030083) for discounted airfare with Air Canada.

Preliminary Speakers' Schedule

Saturday, June 21

Time: 8:30 a.m. to 10 a.m.

Speaker: Kristine A. Hodsdon, RDH, BS

Sponsor: Oral-B

Saturday Keynote Presentation Topic: **OBSTACLES ARE ONLY THOSE THINGS WE SEE WHEN WE TAKE OUR EYES OFF OUR GOAL**

Summary: Kristine Hodsdon will help us re-examine our role in the hygiene profession through a joyful and heartfelt presentation. There are steps we can take to gain control of our reputation and professional image, most of which are easily accomplished and will have a dramatic effect on all areas of our lives. **Note:** Ms. Hodsdon will also be making presentations at 10:30 a.m. and at 2 p.m. on clinical topics (these will be concurrent sessions). Visit the CDHA web site for updates on these presentations!



Time: 10:30 a.m. to 12 noon (concurrent session)

Speaker: Susan Isaac, RDH, BScD, MEd

Sponsor: Philips Oral Health Care

Topic: **ORAL HEALTH THROUGH THE GOLDEN YEARS**

Summary: Ageing is a complex and fascinating process. Having a personal understanding of your own and others' ageing process will enhance your ability to work effectively with friends, family, and clients. This course will focus on the biological, physiological, and psychological changes that occur as we age, while implementing key strategies to utilize in your dental practice. Various clinical aspects of seniors will be discussed, as well as a product review for specific treatments.

Time: 10:30 a.m. to 12 noon (concurrent session)

Speaker: Patricia Johnson

Topic: **DENTAL HYGIENE IN CANADA: PATTERNS, TRENDS, AND CHANGES**

Summary: This presentation will review the paper prepared by Ms. Johnson that reports the findings of a national survey undertaken in 2001 to investigate the characteristics and deployment of dental hygienists in Canada. Of particular interest are patterns of clinical practice and personal, occupational, and workplace-related factors associated with those patterns. Trends and changes over the past 12-year, and in some cases 20-year, period are also examined. Implications of the study's findings for the dental hygiene profession and for planning, for example, human resource requirements to meet oral health needs and demands are considered.

Time: 2 p.m. to 3 p.m. (concurrent session)

Speaker: Dr. Amil Shapka

Topic: **KINDNESS IN ACTION DENTAL MISSIONS**

Sunday, June 22

Keynote Speaker, Joan McCusker



Ms. McCusker, Canadian Olympic Gold medallist in women's curling, will provide us with an insider's view of the Olympic Games. An enthusiastic and motivational speaker, Ms. McCusker will share amusing anecdotes and pictures (as well as her Gold Medal!) from her time in Nagano, Japan.

Joan was raised on the family farm near Saltcoats, Saskatchewan, and attended high school in Yorkton, Saskatchewan. She was the SRC class president and won the 1983 Saskatchewan High School Curling Championship. Joan continued her education at the University of Saskatchewan, obtaining her Bachelor of Education degree in 1987. She went on to teach in Raymore and Regina. Joan resigned her teaching position in 1998 to dedicate more time to her family, curling, and her new career as a professional speaker. Joan's curling career has earned her numerous titles including Olympic Gold Medallist (1998, Nagano, Japan) and three-time Canadian and World Women's Curling Champion (1993, 1994, 1997). When Joan is not curling, speaking, or providing curling commentary on CBC, she enjoys cycling, walking, fastball, swimming, golf, and cross-stitching.

All conference information will be posted on the CDHA web site (www.cdha.ca) as it becomes available.

BRITISH COLUMBIA

ABBOTSFORD Well-established family practice looking for hygienist for six-month maternity leave, Feb. 1, 2003 to Aug. 31, 2003. Enjoy a modern, patient-centred practice with a hygiene program devoted to long-term periodontal care. Abbotsford is one hour travel time from either Vancouver or skiing on Mt. Baker. Position four days per week: Monday to Thursday, 8–5. Please call Edna at 604-853-6115 to arrange an interview or e-mail <ronaldporth@hotmail.com>.

ABBOTSFORD Dental hygienist required for a busy Abbotsford dental office. Part-time or full-time starting January 2003. Send résumé to Dr. Venier, 33782 Marshall Road, Abbotsford, BC V2S 1L1.

AGASSIZ Well-established practice looking for a hygienist 1, 2, or 3 days a week. Nice community to work in with an excellent salary. New grads welcome. Send résumé to Box 699, Agassiz, BC V0M 1A0, by fax to 604-796-3619, or telephone 604-796-2181.

LOWER MAINLAND Fun, friendly office in the Lower Mainland seeking hygienist. Days and hours flexible (although full-time preferred). Assistant available to help you. Great patients with high dental IQ. Please contact Crista at 604-315-4465 or e-mail her at <crista@shaw.ca>.

SALMON ARM Hygienist required immediately for busy three-dentist practice located on the Shuswap Lake in Salmon Arm. Our team has a strong focus on periodontal care within our diverse dental practice. Excellent earning potential. Please fax résumé to 250-833-1086 or call Dawn at 250-833-1186.

SALMON ARM Full- or part-time hygienist required immediately for dental practice in Salmon Arm on the Shuswap lake. Our practice supports a strong focus on periodontal health care and includes two dentists and employs three hygienists. References are requested. Please fax résumé to 250-833-1176.

VANCOUVER Well-organized office in Greater Vancouver requires dental hygienist immediately for 10-month maternity leave. Monday to Thursday work week. For more information, call Gerri at 604-931-9022 or fax 604-931-6417.

VANCOUVER F/T and P/T hygienists to join our team. Vancouver suburb (Burnaby) accessible via Skytrain. Friendly, progressive office using the latest hygiene methods. Flexible hours and above-average income. Lots of time off to enjoy the great outdoors. New grads welcome. Fax résumé to 604-526-1099 or call 604-526-8006.

VICTORIA Full-time dental hygienist position is available in Victoria, B.C. Send résumés to Dr. Todd Regnier, #115 Victoria Eaton Centre, Victoria B.C. V8W 3M9. Telephone 250-381-6433; fax 250-381-6421; e-mail <jean2@islandnet.com>.

MANITOBA

PINAWA Be part of a modern dental practice in Pinawa, Manitoba, a beautiful recreational community on the Winnipeg River, one hour from Winnipeg. Close to skiing, hiking, water sports, and golf. Excellent hours,

benefits, staff, and environment. Generous salary and signing bonus. Interested applicants may inquire by phone: 204-753-2787 or by e-mail <youngkk@mb.sympatico.ca>.

ONTARIO

CAMBRIDGE Dental hygienist required; permanent part-time (20–30 hours weekly). Base salary plus bonus (average hourly wage \$45/hr). Anticipated start date: as soon as possible. We are able to assist with housing for any out-of-town applicants. Please contact Grandview Dental Centre, 171 Hespeler Road, Cambridge, ON N1R 3H6. Telephone 519-622-4500; fax 519-622-6553; e-mail <espennato@prodigy.net.mx>.

NOVA SCOTIA

TRURO Dental hygienist urgently required. Busy family practice. Excellent salary and working conditions. Full- or part-time. No nights or weekends. Extended health insurance and continuing education assistance. Apply to Dr. John Cook, 96 Dominion St., Truro, NS B2N 3P3. Telephone 902-895-6307; fax 902-897-2983; e-mail <johncook@tru.eastlink.ca>.

INTERNATIONAL

ADELAIDE, AUSTRALIA Dental hygienist – opportunity to join our orthodontic practice. Orthodontic experience advantageous but not essential. Will help with visa and licensure. Adelaide is a beautiful beach side city of one million people, enjoying a Mediterranean climate, with summer almost upon us. Please contact Dr. Grant Duncan at <grantwduncan@yahoo.com>.

LUGANO, SWITZERLAND Diligent hygienist for prevention-oriented perio office; 5 days/week, 4 weeks vacation, 1 mo. bonus salary/year. Previous perio experience. Knowledge of Italian or willingness to learn. Send CV to Dr. O. Balmelli, Via Maggio 13, 6900 Lugano, Switzerland. For further inquiries, Nada Mercuri, RDH, at <nads@ticino.com>.

GLOBAL HYGIENISTS COMMUNITY Are you looking for a change? A global adventure? Dental Hygiene employment opportunities are available in Europe, the Caribbean, New Zealand, Canada, and the United States. We are a placement liaison service providing you with the jobs, resources, connections, and guidance that you need as you pursue your new journey. Visit our website at www.globalhygienists.com or call 416-828-5024.

CDHA On-line Job Database for Members Only

Use our on-line Job Database to reach over 10,000 CDHA members across Canada whenever you need to advertise an employment opportunity. It's convenient, cost-effective, and it gets your message promptly to the target audience. Contact CDHA for more information at (613) 224-5515 or info@cdha.ca

"SHORTAGE OF DENTAL HYGIENISTS?" (continued from page 23)

has been shown that the remuneration package for 90 percent of dental hygienists in 2001 consisted of wages only; no benefits were provided. Cross-sector comparisons for like professions suggest that the dental hygienists' earnings should be adjusted "downwards by a factor of at least 10%" to compensate for the lack of benefits.⁹

We look forward to analyzing, early in the new year, the responses to the CDHA labour survey that many of you participated in and reporting back to you how dental hygienists feel about their employment situations.

CDHA is one of five partners in a proposed Oral Health Care Sector Study project to assess the human resource requirements in oral health. This includes the validation of projections and data to accurately forecast human resource needs in order to create a comprehensive long-term plan for the oral health workforce. We look forward to actively participating in this national project to ensure that we have accurate data to make informed decisions.

Endnotes

1. Ward, Thomas F.: Scarcity of health human resources: a chronic national disease. *HealthcarePapers* 3(2): p. 71, 2002
2. British Columbia Dental Hygienists' Association: Employment Opportunities Line Statistics. November, 2002
3. Canada. Health and Welfare Canada: Canada health manpower inventory 1976. The practice of dental hygiene in Canada: description, guidelines and recommendations. Part One. Ottawa: Health and Welfare Canada, 1988. Cat. No. H34-33/1-1988E. In: Johnson, P.M. Dental hygiene practice in Canada 2001. Report No. 3: Findings. Ottawa: CDHA, p. 380, 2002
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9. Johnson: p. 394

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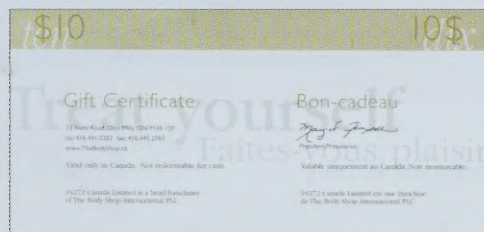
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The Canadian Dental Hygienists Association

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de l'Association canadienne des hygiénistes dentaires

VOLUME 37 NUMBER 2



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I Have a Dream

by Karen Wolf, DipDH

Our world is changing. From technological advances both at home and in space to threats to our peaceful society, we are not as we were even 10 years ago. The past can offer us wisdom but cannot sustain the present or fulfill our future. I remember reading that the quality of our present life comes from working to fulfill our dreams for the future. What are your dreams? I hope each of you has at least one. But even with dreams, we need to focus on what we have and work with that, rather than being troubled about what we don't have. In other words, worrying will not help anyone—just dare to dream and work to fulfill that dream.

As your president, my role is to focus on working with our association's leaders to create a framework where these dreams can become a reality. Many of you began the dream some years ago and in 2003 we are still working to achieve it. Many changes have taken place, many accomplishments that represent years of devotion. But we must continue to build on our achievements by dreaming anew.

I have a dream where dental hygienists across Canada practise collaboratively within the health care field and are respected team members who make evidence-based decisions. This level of professionalism ensures dental hygienists have a seat at all discussion tables surrounding health-related issues. As well, we are invited to speak at allied health care conferences and meetings.

I have a dream where treatment is only one aspect of client-based care. Community involvement including advocacy is valued by employers, the community, and hygienists alike. Hygienists are able to use the breadth of their education and training in their day-to-day activities and this leads to a greater degree of professional satisfaction and an improved quality of life for our communities.

I have a dream where referral-based alternate/specialty practice settings help improve recruitment and retention within



I have a dream

where dental

hygienists across

Canada practise

collaboratively

within the health

care field.

J'ai rêvé d'un monde

par Karen Wolf, DipDH

Notre monde est en constant changement. Depuis les percées technologiques, à la maison comme dans l'espace, jusqu'aux menaces qui planent sur notre société pacifique, rien n'est plus comme il y a 10 ans. Le passé peut nous offrir la sagesse, mais il ne peut nourrir le présent ou bâtir notre avenir. Je me souviens avoir lu quelque part que la qualité de notre vie actuelle provient de ce que nous travaillons à réaliser nos rêves d'avenir. Et quels sont ces rêves ? J'espère que tous et chacun ou chacune d'entre nous en a au moins un. Mais, même avec des rêves, nous avons besoin de nous concentrer sur ce que nous avons et de travailler avec ce matériau, plutôt que de nous en faire avec ce qui peut nous manquer. Autrement dit, se faire du souci n'aidera personne; il suffit d'oser rêver et de travailler à réaliser ce rêve.

En tant que présidente de cette association, mon rôle consiste à focaliser sur le travail fait avec les dirigeants de notre association pour créer un cadre où ces rêves peuvent devenir réalité. Beaucoup d'entre vous ont lancé le rêve il y a quelques années et, en 2003, nous travaillons encore à le réaliser. Beaucoup de changements ont eu lieu, beaucoup d'accomplissements qui représentent des années de dévouement. Mais nous devons continuer à bâtir à partir de nos propres réussites en faisant de nouveaux rêves.

J'ai rêvé d'un monde où les hygiénistes dentaires de tous les coins du Canada pratiquent dans un cadre de collaboration avec le domaine des soins de santé et sont des membres respecté(e)s de l'équipe, qui prennent des décisions fondées sur la preuve. Ce niveau de professionnalisme assure les hygiénistes dentaires d'avoir un siège à toutes les tables de discussion

entourant les questions qui touchent la santé. Pareillement, nous sommes invités à adresser la parole à des conférences et à des réunions de soins de santé alliés.

J'ai rêvé d'un monde où le traitement n'est qu'un aspect des soins axés sur le client. L'action communautaire, y compris

I HAVE A DREAM ...continued on page 75

J'AI RÊVÉ D'UN MONDE ...suite à la page 84



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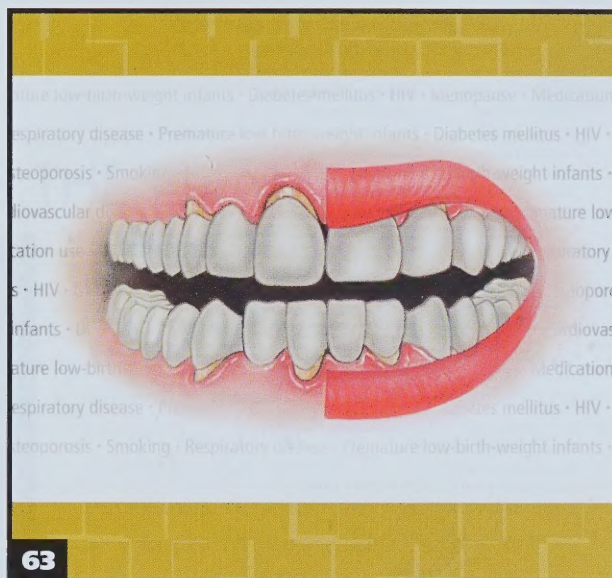
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Periodontal Medicine: Fiction or Reality?

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POP GOES THE ENAMEL!



Soft drinks promote tooth erosion that cannot be corrected by fluoride.

In the last few decades, beverage consumption has shifted from milk to fruit juices to soft drinks—or from nutritious to less so.¹ Children who do not drink milk are likely to have inadequate intakes of the nutrients they need to build strong teeth and bones. The simple fact is children need more milk, more often. Canadian data indicate that eight out of 10 girls and six out of 10 boys, aged nine to 18 years, fail to meet the recommended daily amount of calcium (1,300 mg; the equivalent of about four 250 mL glasses of milk).² In fact, according to US data, among children aged five to 17 years, only those who include milk at their noon meal meet the recommended calcium intake.³

Milk provides 45% of teens' dietary calcium,^{2,4} in comparison to 15% from other milk products.

The problem is that inadequate milk consumption is not being compensated by increased consumption of other milk products. Only 20% of adolescent girls and about 33% of adolescent boys meet their requirement for calcium.⁵ But calcium is only part of the picture. Milk is also the number one food source of phosphorus, riboflavin and vitamin D, and an important source of potassium, magnesium, vitamin B₁₂, zinc and high quality protein in the diets of children.⁶

The problem with soft drinks isn't so much what they contain (although the sugar content is staggering), it's what they don't contain: the nutrients needed for teeth and bone health. According to the experts, the most plausible explanation for the association between carbonated drinks and poor bone health is the displacement of milk.⁷

Substituting a glass of milk for one of a carbonated soft drink could have a substantial impact on children's daily nutrient intake,⁸ and on their teeth. In a recent study in which teeth were exposed to soft drinks or orange juice, both with calcium fluoride added, the more acidic the drink, the more calcium fluoride was dissolved and the greater the erosion of dental enamel. In fact, the erosion-protective effect of even high fluoride concentrations was ineffective for acidic soft drinks.⁹

Kids who consume two to three daily servings of milk products are more likely to meet the recommendations for calcium, vitamins A and B₁₂, folate, riboflavin, phosphorus and protein.¹⁰

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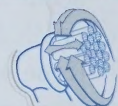
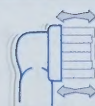
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Baccalaureate as Entry to Practice

by Susan Ziebarth, CHE

In the last 50 years in British Columbia, dental hygiene has evolved from a list of procedures a dentist could tell his "girl" to perform to a self-regulating profession with educational standards only a few credits short of a degree.

— Nancy Harwood¹



The new year got off to a great start for the dental hygiene profession! The College of Dental Hygienists of British Columbia has committed to making a baccalaureate degree the entry-to-practice standard for students starting their education in 2005. In a press release dated January 10, 2003, registrar Nancy Harwood indicated the support of the British Columbia Dental Hygienists' Association and the Canadian Dental Hygienists Association in acknowledging the complexities of present-day practice and the need to make the degree the entry standard.

While a dental hygiene degree is available at the universities of British Columbia, Alberta, and Toronto, only British Columbia has set a target date for making the degree a requirement. Existing practitioners will be exempt, and newcomers from other regions can be registered to practise under supervision and with conditions until they have completed their B.C. education.

This is a major step toward achieving CDHA's long-term goal of having dental hygiene recognized for the profession it is. As dental hygiene has grown and evolved over five decades, guided by the explosion of new knowledge, changing demographics, and new technologies, the need for advanced educational opportunities has become a necessity

BACCALAUREATE AS ENTRY TO PRACTICE
...continued on page 85

Le baccalauréat comme seuil d'entrée à la pratique

par Susan Ziebarth, CHE

Au cours des 50 dernières années, en Colombie-Britannique, l'hygiène dentaire a évolué et est passée d'une liste de procédures qu'un dentiste pouvait dire à sa "fille" d'exécuter à une profession auto-réglémentée dont les normes académiques ne sont qu'à quelques crédits près d'un diplôme universitaire.

— Nancy Harwood¹

La nouvelle année a démarré du bon pied pour la profession de l'hygiène dentaire ! L'Ordre des hygiénistes dentaires de la Colombie-Britannique s'est engagé à faire du baccalauréat la norme d'entrée dans la pratique pour les étudiants et étudiantes qui commenceront leurs études en 2005. Dans un communiqué de presse publié le 10 janvier 2003, la registraire Nancy Harwood a fait état de l'appui de l'Association des hygiénistes dentaires de la Colombie-Britannique et de l'Association canadienne des hygiénistes dentaires en reconnaissant les complexités de la pratique actuelle et le besoin de faire du diplôme la norme d'entrée à la profession.

Même si le diplôme d'hygiène dentaire se donne dans les universités de la Colombie-Britannique, de l'Alberta, et à Toronto, seule la Colombie-Britannique a fixé une date butoir pour faire du diplôme une exigence. Les personnes qui sont présentement dans la pratique seront exemptées, et les nouveaux venus d'autres régions peuvent être enregistrés pour pratiquer sous supervision et avec des conditions, en attendant d'avoir complété leur scolarité en C.-B.

Il s'agit là d'un pas de géant dans le sens de l'objectif à long terme de l'ACHD, soit celui de faire reconnaître l'hygiène

**This is a major step
toward achieving
CDHA's long-term goal
of having dental
hygiene recognized for
the profession it is.**

**LE BACCALAURÉAT COMME SEUIL
D'ENTRÉE À LA PRATIQUE**
...suite à la page 85

1. Registrar of the College of Dental Hygienists of British Columbia. Quoted in the January 10, 2003, press release, BC Dental Hygienists First in Canada to Commit to Degree Education Only a Few Credits Short Now.

1. Registraire de l'Ordre des hygiénistes dentaires de la Colombie-Britannique. Cité dans le communiqué de presse du 10 janvier 2003, BC Dental Hygienists First in Canada to Commit to Degree Education Only a Few Credits Short Now.

The Evolution of the Dental Hygienist

by Leanne Carlson-Mann, DipDH, DipDT*

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I was very pleased to be asked to write the guest editorial for *Probe* and hoped I could give enough history on how the field of dental hygiene has evolved. As I started to reminisce about my career, I quickly realized that, yes, after 21 years in the field, I have seen many changes. It has been a bit humbling though to realize I am at such an age and have enough experience to be asked to share my thoughts on the topic. I guess I should have seen this coming—one of the visiting dental hygiene students happily informed me that I graduated the year before she was born! I didn't dare add that I worked long before the era of latex gloves, although it was after the extinction of the cuspidor. And so the story begins...

When I began my career as a dental hygienist (with my Farrah Fawcett hairdo), life was easier. At that time, we were taught that all people had an equal chance of getting periodontal disease. People were treated more or less the same way and post-treatment maintenance intervals were similar. As a hygienist, I was able to do limited examinations, home care instruction, mechanical removal of dental deposits by scaling and root planing in addition to conducting rudimentary maintenance therapy. There were a lot of successes and, of course, failures. Patients referred to a periodontal office had very little knowledge about why they had been referred; when asked, many would reply, "I have pocket disease." A sad point is that some 21 years later, a majority of patients still feel they are being referred for treatment of "pocket disease." In the 1980s, treatment in the generalist office was completely oriented toward restorative treatment and dental plans were constructed to fund primarily "repair" therapy. As time went by, "soft tissue management" programs began to appear and



I see the hygienist
of the future having
a solid knowledge
of "periodontal
medicine" and being
much more involved
in treatment
planning.

the utilization of scaling and root planing increased massively. Although helpful, many soft tissue management programs on their own held little long-term benefit for the patient. Too much attention was being paid to adjunctive therapy such as irrigation and subgingival antibiotic therapy rather than timely referral to the periodontist for therapy that would reduce pockets and regenerate bone and soft tissue defects.

As we head into 2003, I see a real change coming in dental hygiene. Clinical skills are of paramount importance, but now we have good scientific data so we can routinely perform periodontal risk profiles for our patients. We now know that not all patients are equally at risk of developing severe periodontal disease. Studies in the United States indicate that of our patients, about 26 per cent are at risk from cigarette smoking, 12 per cent have diabetes mellitus, 35 per cent have genetic risk factors, 20 per cent of postmenopausal females have problems with osteopenia/osteoporosis. Add to this the 10 per cent of the population who are under extreme stress, the 29 per cent who are obese, and the 5–35 percent who have pre-existing periodontal disease, and we have the means of customizing treatment after initial examination and applying this knowledge after treatment for maintenance therapy. Our current knowledge of bacterial pathogens and the pathogenesis of periodontal disease has changed dramatically. We are familiar with lab testing procedures for patients when indicated. We also have good scientific data about the systemic effects of periodontal diseases, particularly with regard to cardiovascular disease, pregnancy complications, and diabetes, and we are able to pass this knowledge on to our patients. We are moving towards a "wellness" concept but this is being delayed because of the difficulties associated with changing funding of dental insurance plans, which are still aimed at repair and restorative therapy.

I see the hygienist of the future having a solid knowledge of "periodontal medicine" and being much more involved in treatment planning. This hygienist will have top-notch clinical skills but will no longer be looked upon as a "cleaner of

* Leanne Carlson-Mann is a licensed dental therapist and hygienist in Saskatchewan and has been in periodontal practice for the past 21 years. She received her implant training at the University of Washington and works with implant patients from surgery through to maintenance. For 15 years, Leanne taught the implant portion of the dental hygiene program to second-year students at the Saskatchewan Institute of Applied Science and Technology. As well as being a contributing editor for *Probe*, she has published over 30 articles including some for international journals and has lectured extensively on behalf of dental implant companies throughout Canada and the United States.

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NDHW activities in Nova Scotia

by Bernice Doucet, President, NSDHA



Dental hygienists from Cape Breton to Yarmouth were busy promoting oral health and the dental hygiene profession during NDHW. Our executive assistant, Rosemary Bourque, contacted major

newspapers and radio stations not already involved in activities to let them know we were celebrating NDHW so they could promote the week if possible.

Activities of the northern component including the following: a giveaway contest on radio involving a trivia question related to oral health, with a power toothbrush as the prize; public service announcements for dental hygienists on a local radio and cable television station; and features of local-area hygienists in the Amherst Daily News promoting NDHW. Our efforts were a success, as many clients mentioned hearing about us on the radio and seeing the picture in the newspaper. One client brought my colleague and me Tim Horton's gift certificates in an envelope that read, "For all the great work you do ... Happy National Dental Hygienists Week!"

The Cape Breton component purchased Oral-B Braun toothbrushes, collected samples of oral health products, and made up 10 packages to give away on two radio stations. Questions were developed for the program host to read on air and callers phoned in with correct answers to win the package. Gwen Aucoin, co-chair for Cape Breton, was interviewed on CBC radio.

The Halifax component had a similar activity in which 10 power brushes were given away on two radio stations during their morning radio shows. The Halifax component also entered a

team in the "Run for the Cure" and held a scientific education day addressing such topics as smoking cessation, sealants, maxillofacial prosthetics, and the Nova Scotia fluoride mouth rinse program.

The South West Nova Component participated in an all-day mall display with a booth on Saturday, October 19, 2002. They provided handouts and distributed free toothbrushes. I was interviewed on CJLS in Yarmouth and on CIFA, our local community radio, to promote NDHW. The stations also advertised the activity during the week so quite a few people visited the display to receive their free toothbrush.

NDHW activities in New Brunswick

Moncton – by Anne Comeau



Dental hygienists in the area visited a psychiatric ward of the Veterans Residence with toothbrushes for the residents; gave social workers toothbrushes to be distributed to the homeless, needy, and troubled

teens; and visited a hospital of the Department of Veterans Affairs with toothbrushes and mouth rinse. As well, Sharon Linder submitted an article paying tribute to NDHW to the Moncton Times & Transcript. Local hygienists also held a gathering after the CDHA conference for dinner and celebration.

Saint John – by Kelly Joyce-Floyd

The Saint John component provided blood donors at Canadian Blood Services clinics with toothbrushes, educational posters, and apples (provided by Stirling Apples). In addition, Trudy McAvity made radio announcements on local stations to promote NDHW.

Oral Health Message Educates Ontarians

by Joanne Emerson, consultant for ODHA

Health-conscious Ontarians received another friendly reminder about the important role that oral care plays in their overall health. This reminder came last year from the Ontario Dental Hygienists' Association (ODHA) during an ambitious 28-week public awareness campaign, which ran from May to November.

The 2002 multi-media campaign focused on educating the public about good oral hygiene practices and the critical link between oral care and overall health. It also described the role that dental hygienists play in preventing gum disease and tooth decay. The message had the potential to reach more than 30 million residents of Ontario through a variety of media.

Emphasis was placed on television advertising with ODHA's 30-second and new 15-second commercials airing on CH, Global, CFMT, and CKVR. Radio airtime was purchased on CHUM-FM, 680 News, and E-Z Rock for two weeks in October prior to and during National Dental Hygienists Week.

A significant shift in the selection of media program purchases—from daytime to evening—resulted in an 18 per cent increase in primetime TV airing over the previous year.

The 2002 print program included a full-page ad in the October edition of Chatelaine magazine, plus a dental hygiene story on children's oral health in the same issue.

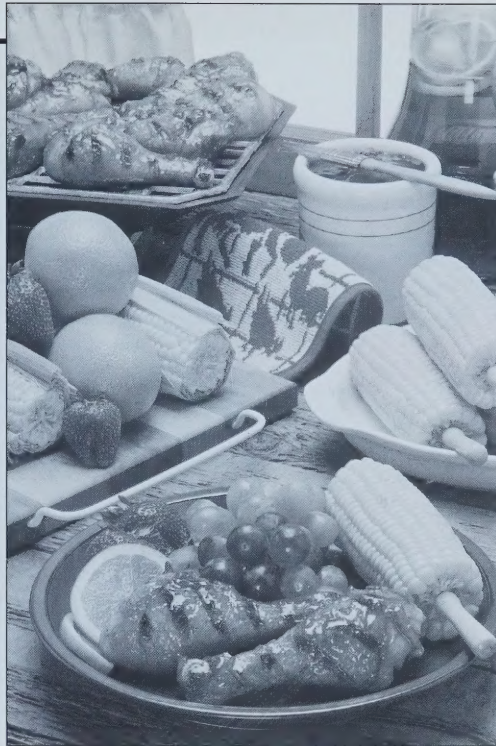
As part of the campaign's evaluation process, the ODHA conducted a feedback survey of its members to find out what types of comments their clients made about the public awareness campaign. Members said that close to half of their clients offered unsolicited comments about the campaign, indicating that ODHA's media activities are helping to increase their understanding about the importance of oral care and the role of dental hygienists. ODHA members are a good source of information since they treat and talk to more than 5 million clients a year.

odha
 Ontario Dental Hygienists' Association

March Nutrition Month Offers Solutions to Women's Nutrition and Healthy Eating Challenges

As part of Nutrition Month 2003, the Dietitians of Canada is releasing the results of The Kraft Canada, Dairy Farmers of Canada and Dietitians of Canada Report on Healthy Eating Challenges Facing Women. The survey reveals the healthy eating challenges and concerns of women aged 24–45 from across the country. Not surprisingly, the number-one concern is the lack of time to plan, purchase, and prepare healthy foods that family members will enjoy. Dietitians report concerns about the high cost of eating well for some people and the fact that many women lack meal planning and cooking skills. One dietitian wrote: "This is a generation that has grown up on eating out and fast food. Often I am asked for basic cooking advice, such as how to prepare a roast."

Visit the Dietitians of Canada's special Nutrition Month web site (<www.dietitians.ca/eatwell>), starting March 1, 2003, for daily tips, Health Eating Challenges and Solutions for women, a virtual kitchen, answers to frequently asked nutrition questions, and help in finding a local dietitian. You can also contact a dietitian in your region through your local public health department, hospital, or community health care centre. To obtain a referral to a dietitian in private practice, call 1-888-901-7776.



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International Federation of Dental Hygienists News

On behalf of the International Federation of Dental Hygienists and its House of Delegates, we are pleased to announce that the premier issue of the International Journal of Dental Hygiene is now available. This international peer-reviewed journal is a milestone in the progress of the dental hygiene profession. It is a new way for dental hygienists to share information, enhance the profession, and promote oral health. Now colleagues around the world can share their research and experiences. In the articles, we can read about the similarities and differences in dental hygiene practices in other countries as well as the achievements and struggles that are dealt with by colleagues. The International Dental Hygiene Symposium held every three years provides an opportunity for dental hygienists to present research to their peers. The next opportunity for dental hygienists to meet internationally is in Madrid, Spain, July 8–11, 2004. The International Journal of Dental Hygiene offers an avenue to share international research between symposiums. We welcome this research journal and congratulate the editor Marjolijn Hovius on its birth. We are especially proud to note that two of the peer-reviewed articles are authored by Canadians. The four issues a year are US\$81.00 plus GST. For more information and to subscribe, go to <www.blackwellmunksgaard.com/ijdh>.

— Lynda McKeown and Patty Wickstrom

CDHA Representatives to the House of Delegates of the International Federation of Dental Hygienists

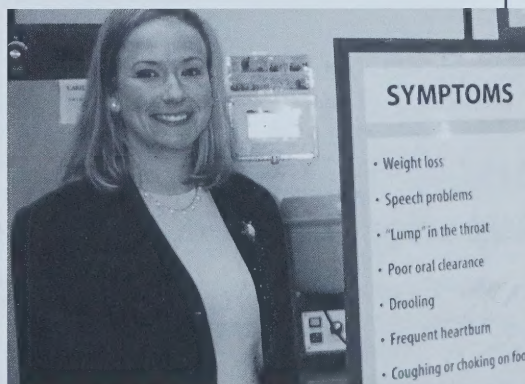
2002 Oral-B/CDHA Dental Hygiene Diploma Student Scholarship

Oral-B and CDHA are happy to announce our newest award recipient. The 2002 Oral-B/CDHA Dental Hygiene Diploma Student Scholarship goes to **Christine Johansen** of North Vancouver, British Columbia.

Christine was attracted to the dental hygiene field by the profession's ability to affect the health and welfare of others. She is currently in her final year of dental hygiene studies at Vancouver Community College but she still finds time to promote dental hygiene within her local community. In her spare time, Christine is involved in synchronized ice skating and is training to compete at the national championships this month.

The Student Scholarship Awards Committee commends all of this year's applicants for their dedication to their education and looks forward to welcoming them all as colleagues upon graduation.

The CDHA would like to extend special thanks to our partner, Oral-B, for its active participation in our efforts to support our dental hygiene diploma students through this scholarship.



Christine Johansen presented a table clinic at the Vancouver and District Dental Mid-Winter Conference on Dysphagia



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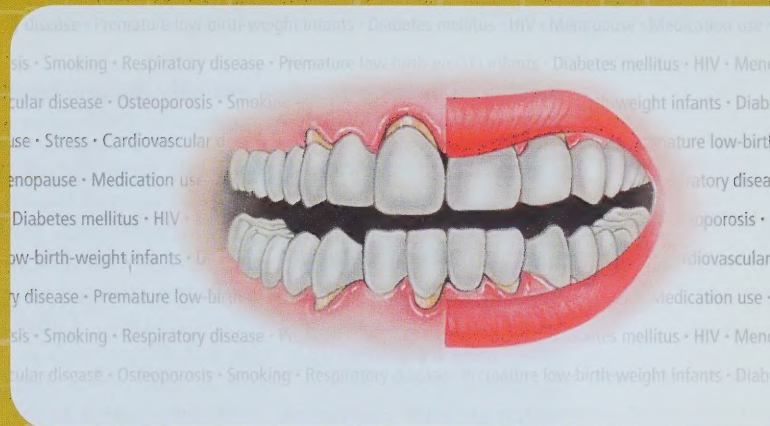
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Periodontal Medicine: Fiction or Reality?

by Salme Lavigne, RDH, BA, MS(DH)*



Introduction

Since the release of the U.S. Surgeon General's report on oral health on May 25, 2000,¹ there has been an escalation of research activity that attempts to substantiate causal relationships between periodontitis and a number of systemic diseases. The report emphasized that systemic diseases can have oral manifestations and that certain oral diseases can also have systemic implications. This suggested bi-directional relationship may have a significant effect on the management of the medically compromised patient. If indeed this relationship exists, it could significantly change the relationship between the oral health professions and the medical profession.

A number of recent studies have provided evidence suggesting that periodontitis may increase the risk for systemic disorders such as cardiovascular diseases and premature low-birth-weight infants.²⁻⁵ Risk factors for periodontal disease have been studied extensively; these include specific bacteria, smoking, and systemic diseases such as diabetes mellitus.^{6,7} Genetic factors, which are based on polymorphisms and inflammatory responses, have also been identified.^{8,9} It has been estimated that approximately one-third of the adult population is afflicted with some form of periodontitis.¹⁰⁻¹² Advanced destruction from this inflammatory disease affects one of every eight individuals, with the prevalence increasing to one of every three persons by the age of 55 to 65 years.¹⁰

The etiology of periodontal disease has been linked with specific bacteria such as *Porphyromonas gingivalis*, *Actinobacillus actinomycetemcomitans*, *Bacteroides forsythus*, and *Treponema denticola*.^{13,14} Dental plaque has been identified as a matrix-enclosed environment in

which pathogenic bacteria co-exist. This plaque functions as a microbial biofilm that exposes the host to bacterial cell surface components such as lipopolysaccharide (LPS) and other bacterial products which can penetrate the tissues within the gingival sulcus. These products, when contacted by host defence cells such as monocytes and macrophages, form complexes with binding proteins on the surface of the host defence cells. This binding results in the release of local immuno-inflammatory mediators such as cytokines and arachidonic acid metabolites that ultimately are responsible for the tissue destruction and attachment loss occurring in active periodontal disease.¹⁵

It has been estimated that approximately one-third of the adult population is afflicted with some form of periodontitis.

The central hypothesis of "periodontal medicine" is that infections from periodontitis present as a chronic inflammatory burden at a systemic level. This is not a new concept. In fact, in 1891, Miller described his focal theory of infection and suggested that the following diseases had oral origins: pneumonia, meningitis, syphilis, tuberculosis, and septicemia.¹⁶ The focal theory of infection, however, was not revisited for a significant period of time. In 1989, almost a century later, Finnish researchers utilized sound scientific methods to reintroduce the association between systemic disease and oral infection.² Epidemiological studies supporting the concept that periodontal disease may be a separate risk factor for cardiovascular disease and premature low-birth-weight babies began to emerge.^{3,4,5} In light of these findings, Offenbacher coined the term "periodontal medicine" as a discipline that studies the relationship between systemic disease and periodontitis.¹⁵ This term implies a two-way street, an interface between medicine and dentistry. It is now inherent upon periodontal researchers to pave the way through randomized controlled clinical trials, providing clinicians with a guide to evidence-based decision-

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making in order to improve not only the oral health but the systemic health of their clients.

The concept of periodontitis as a risk factor for other systemic diseases is not one to be tossed around loosely. The term *risk factor*, when used by epidemiologists, generally implies the probability of an individual's developing the disease. However, standard definitions of the term risk factor imply some relationship to causality.¹⁷ Other terms often used synonymously with risk factor, such as *determinant* and *risk marker*, make it difficult to determine which are truly risk factors. In order to alleviate this confusion, the World Workshop on Periodontics¹⁸ adopted a working definition of the term risk factor which is more useful:

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Risk factor: an environmental, behavioral, or biologic factor confirmed by temporal sequence, usually in longitudinal studies, which if present, directly increases the probability of a disease occurring, and if absent or removed, reduces the probability. Risk factors are part of the causal chain or expose the host to the causal chain. Once disease occurs, removal of a risk factor may not result in a cure.

Offenbacher coined the term "periodontal medicine" as a discipline that studies the relationship between systemic disease and periodontitis.

Because temporal evidence is required, the randomized controlled clinical trial is the only study design that allows interpretation of causality. Furthermore, cross-sectional studies can only define a factor that may be a "probable" risk factor or *risk indicator* and must be confirmed by longitudinal studies. Both the randomized controlled clinical trial and the longitudinal study are expensive, difficult, and often impossible to conduct due to the ethical considerations. Thus, with all this in mind, the current evidence that is available in establishing whether periodontitis is a risk factor for certain systemic diseases must be viewed with caution.

This paper will review the bi-directional relationship between periodontitis and a variety of systemic diseases and will explore the literature regarding causality.

Systemic conditions as risk factors for periodontal disease

For a number of years, there has been a variety of systemic conditions implicated as having periodontal sequelae. Most of these diseases/conditions do not have a bi-directional relationship with periodontal disease. However, a few conditions such as diabetes have been recognized as having this dual relationship. As the discussion

ensues, those conditions with suspected bi-directionality will be identified.

Diabetes mellitus

Epidemiological studies suggest both insulin-dependent diabetes mellitus (IDDM) and non-insulin-dependent diabetes mellitus (NIDDM) are significant risk factors for periodontal disease. Although it is unclear why diabetes increases the risk for periodontal disease, increased susceptibility to infection and host response have been identified as likely factors. Oral manifestations in diabetics—such as severe gingival inflammation, acute gingival and periodontal abscesses, rapidly advancing periodontal disease, increased attachment loss and bone loss—led the Diabetes Commission to recognize periodontal disease as the sixth complication of diabetes.¹⁹ A significant number of studies exist supporting the premise that poorer glycemic control contributes to poorer periodontal health.²⁰ Well-controlled diabetics have been shown both to respond well to periodontal therapy and to present no greater risk for periodontitis than non-diabetics.²¹ It has also been suggested that therapy not only improves the periodontal condition of the diabetic patient but may also improve metabolic control of the disease itself.²² This suggested bi-directional relationship is currently being studied by numerous researchers. Their research focuses primarily on mechanisms that affect glycemic control such as advanced glycation end products known as AGEs.²³ These preliminary findings suggest that prevention and control of periodontal disease must be an integral part of diabetes control.

Human immunodeficiency virus infection (HIV)

Individuals with HIV infection are considered to be at risk for periodontal disease. A well-designed 20-month study of 114 subjects found that individuals older than 35 and with CD4 counts of less than 200 increased their risk for attachment loss greater than 3mm by more than 600 per cent. In addition, the same study found that seropositivity, despite immune status, was a risk factor for gingivitis.²⁴ It has also been estimated that approximately 5 per cent of HIV patients develop a severe, rapidly progressing form of necrotizing periodontitis. These manifestations are a result of the immunosuppression encountered by these individuals that inhibits the function of the polymorphonuclear leukocytes (PMNs). Without the protection of the PMNs, opportunistic infections such as candidiasis are common. It is also not unusual for rapid changes to occur in the periodontium. The Centers for Disease Control and Prevention (CDC) have thus suggested that patients who have seroconverted be placed on one-month periodontal maintenance.²⁵ A bi-directional relationship is not suspected with HIV and periodontitis although it is significant to note that control of the patient's periodontal disease assists in preventing increased opportunistic oral infections; this most certainly contributes to a better quality of life for the individual.

Osteoporosis

There is growing evidence that a relationship may exist between osteoporosis and periodontitis. Jeffcoat and co-workers found that factors such as smoking, which predispose individuals to osteoporosis, also placed them at risk for the development of periodontitis.²⁶ The same study suggested a strong correlation between dental bone mass and total bone mass among women, as well as total bone mass and number of remaining teeth. This information can be interpreted bi-directionally, which could mean that tooth loss due to periodontal disease may be a risk factor for osteoporosis. However, conflicting evidence was found in a longitudinal study of 300 women, half of whom were receiving hormone replacement therapy and half of whom were receiving a placebo. Clinical indices were correlated with bone mineral density measurements in an attempt to find a link between osteopenia and periodontal attachment loss. No significant linkage was found.²⁷ As research continues, it will be interesting to see whether this bi-directionality truly exists.

Menopause

As women experience the menopausal period with declining levels of estrogen, physicians often recommend hormone replacement therapy (HRT) to protect against osteoporosis. If indeed there is a correlation between osteoporosis and periodontal disease, it is likely that menopausal and post-menopausal women may be at greater risk for both tooth loss and periodontal bone loss. Evidence of this premise appears in two separate studies: the Leisure World Study²⁸ and the Nurses Health Study.²⁹

Both studies showed similar results in which decreased estrogen levels in post-menopausal women who did not undergo hormone replacement therapy were associated with significantly greater tooth loss. Further studies are required to substantiate these findings and to determine the more precise effect that doses of estrogen or other hormones have on preserving oral bone after menopause.

Smoking

Smoking has been well established as a highly predictive risk factor for quite a number of years and along with diabetes, has been irrefutably deemed to be a risk factor for periodontitis. Numerous studies have demonstrated that smokers were at much greater risk for the development of periodontal disease than non-smokers. A two-part study of more than 1,400 people aged 25–74 years showed that smokers had a relative risk of developing periodontitis that was two to seven times higher than that of non-smokers.^{30,31} Smoking has also been strongly correlated with more aggressive forms of periodontitis and with refractory disease.³² It appears that the mechanism of action includes two periodontal pathogens *Bacteroides forsythus* and *B. gingivalis* that have been shown to persist more in smokers after mechanical debridement than in non-smokers.³¹ Smoking has also been shown to decrease

both humoral and cell-mediated responses with evidence of impaired PMN phagocytosis.³³ A recent study investigated the oxygen sufficiency in both healthy and inflamed gingival tissues in both smokers and non-smokers.³⁴ Results showed that smokers had lower oxygen sufficiency in healthy gingival tissues than non-smokers and also had a reduced ability to adapt the function in inflamed tissues. These findings suggest that smokers may have functional impairments in the gingival microcirculation. It is an integral part of dental hygiene care to incorporate smoking cessation programs into the care plans of clients who smoke.

Medication use

It has been recognized for a number of years that certain medications may alter gingival tissues and increase their risk for periodontitis. It is suspected that there will be a continuing increase in the use of both prescription and over-the-counter medications. It is estimated that by the year 2010, at least 20 per cent of the population will be over the age of 65.³⁵ Since this population is the largest user of prescription drugs, it is inevitable that prescription drug use will increase accordingly, along with the risk for periodontitis. Attitude-altering medications or anti-depressants, such as sedatives, tranquilizers, narcotics, analgesics antimetabolites, and antihypertensives present challenges to patient management and home care motivation. It is often not recognized that some antihypertensive drugs, such as enalapril, have a depressive effect and may alter patient attitude and motivation.³⁵ Additionally, a large number of these attitude-altering medications, along with other drug groups such as antihypertensive agents, analgesics, antihistamines, bronchodilators, anti-parkinsonism drugs and many others have xerostomic side effects. It is well-recognized that xerostomia places the client at risk for root caries and increased plaque accumulation, which escalates the client's susceptibility to periodontal disease. Another side effect of xerostomia is candidiasis, which causes additional problems and furthers plaque retention. It is estimated that approximately 200 to 500 medications have xerostomia as a side effect.³⁶

Numerous studies have demonstrated that smokers were at much greater risk for the development of periodontal disease than non-smokers.

There are a number of medications that affect the gingival tissues, making plaque control a challenge and placing the client at greater risk for periodontitis. Phenytoin, calcium channel blockers, cyclosporin, and amphetamines tend to cause gingival enlargement in a percentage of clients on these medications. Research has shown that approximately 50 per cent of patients taking phenytoin will have gingival enlargement to some extent.³⁷ However, studies have failed to show a correlation

between these enlargements and bone loss.³⁸ In fact, it has been suggested that phenytoin may have a protective effect on bone. Calcium channel blockers such as nifedipine and diltiazem have been shown to cause gingival enlargement in an average of 30 per cent of patients taking these drugs.³⁹ Cyclosporin is an immunosuppressant drug prescribed to prevent organ rejection in patients who have undergone kidney, liver, or heart transplants. To date there is no known substitute and thus the 25 per cent of individuals⁴⁰ who will experience gingival overgrowth as a side effect of this drug will require special oral management.

It is absolutely mandatory that prior to developing dental hygiene care plans, all medications consumed by the client are identified. All medications, including over-the-counter drugs and herbal remedies, should be documented and checked in a dental drug reference book for potential oral side effects and drug interactions. It is not at all unusual to find misuse of medications. Often clients will see several physicians and have independent and conflicting prescriptions. Dental hygienists are in a position to document and look up any potential conflicts with medications. If such conflicts are found, they must be reported to the client's physician.

Results of this large study revealed that stress ... was associated with greater levels of clinical attachment loss or with high levels of alveolar bone loss.

Stress

It is well documented in the medical literature that stress has a negative effect on overall health. Stress causes the production of glucocorticosteroids and cortisone through adrenocorticotrophic and corticotropin-releasing hormones. One effect of these hormonal changes is immunosuppression, which typically reduces resistance to infection.⁴¹ It has been suggested that this phenomenon also places the individual at risk for periodontal disease. A limited number of studies have been conducted to evaluate the relationship between oral health and stress.⁴²⁻⁴⁵ These studies mostly involved small numbers of subjects and few studies were able to demonstrate a relationship between psychosocial health and periodontal disease.

However, a recent study by Genco and co-workers⁴⁶ involving 1,426 subjects between the ages of 25 and 74 investigated the moderating effects of psychosocial factors on periodontal health and was able to control potential confounding variables such as age, gender, smoking, general health, and dental care. Results of this large study revealed that stress, manifested by financial strain and depression, was associated with greater levels of clinical attachment loss or with high levels of alveolar bone loss,

which were independently measured. Interestingly, the results also demonstrated that those individuals who possessed good coping behaviours, even when under financial stress, exhibited no more periodontal disease than individuals not under financial strain. Although further studies are needed to explain this potential association between stress and periodontal disease, this study provides substantial evidence that stress may indeed be related to severity of periodontal disease and thus may place the individual at risk for this disease.

Periodontal disease as a risk factor for systemic conditions

The concept that periodontitis is a risk factor for certain systemic conditions, such as cardiovascular disease and preterm low-birth-weight babies, has allowed investigators to focus on specific risk factors despite the fact that with most diseases, these risk factors are multiple. The multifactorial nature of risk factors is often a combination of genetics and behavioural and environmental exposures. It has become increasingly clear that no single risk factor can be attributed solely to chronic diseases such as atherosclerosis, arthritis, and periodontitis. With all the new statistical techniques available, epidemiologists are now able to sort out how various risk factors contribute independently to a disease. For example, by using logistical regression techniques, they can describe how periodontitis contributes to the birth of preterm low-birth-weight babies, independent of the presence of other risk factors such as smoking.⁴⁷ However, one must keep in mind that it will take randomized controlled clinical trials and longitudinal study designs to verify causality. A discussion of the rapidly growing body of evidence correlating periodontitis with a number of systemic diseases follows.

Periodontal disease and preterm low-birth-weight babies

The two major types of evidence that currently exist relating periodontitis to preterm low birth weight are in the form of animal studies and cross-sectional or case-control studies. Neither of these types can truly establish a causal relationship. However, these studies are important as they have provided valuable information for future studies and for projections of odds ratios that may have an impact on the treatment we provide. The studies could even ultimately influence public health policy if treating periodontitis in the early stages of pregnancy could eliminate a substantial number of premature births.

The concept that periodontitis could initiate premature birth was first tested on hamsters.⁴⁸ Collins and colleagues demonstrated that hamsters receiving live *P. gingivalis* had a 24 per cent decrease in fetal weight. Furthermore, the low-grade infections produced in this study did not produce fever or malaise but did result in increased prostaglandins (PGE-2) and tumor necrosis factor-alpha. A second study by Collins et al⁴⁹ substantiated

ated these findings. The presence of PGE-2 and tumor necrosis factor-alpha is known to induce cervical dilation, uterine contraction, and spontaneous abortion.⁵⁰

Subsequent human cross-sectional studies of women with preterm low-birth-weight infants demonstrated more severe periodontal disease than mothers with normal birth weight babies.⁵¹⁻⁵³ A case-control follow-up study by Offenbacher⁵² showed higher levels of PGE-2 in the gingival crevicular fluid of the mothers who had given birth to preterm infants. In fact, research findings by the Offenbacher group suggest that the consistent presence of PGE-2 in gingival crevicular fluid may provide a less invasive means of testing the amniotic fluid levels of this inflammatory mediator to identify those at risk for premature delivery.⁵³

A large case-control study of over 700 mothers attending the Royal London Hospital in East London investigated the association between maternal periodontal disease and preterm low-birth-weight babies.⁵⁴ Surprisingly, results did not find a significant difference between the study cases and the controls for any of the clinical periodontal indices. However, in the same study, there was a significant association between detection of microbial DNA for *Fusobacterium nucleatum* in amniotic fluid and previous pregnancy complications including premature delivery and premature rupture of the membranes. Since this predominantly oral microorganism has been associated with periodontal disease, an association between preterm spontaneous delivery and periodontitis cannot be ruled out. It is possible that clinical evidence may not always be present. Associations may be found at the molecular level with inflammatory markers. It is evident that more studies are required in order to understand the relationship between periodontitis and preterm low birth weight.

Periodontitis and respiratory disease

Recent studies have suggested a link between respiratory infections and periodontitis. Dental plaque, which is a complex biofilm, can be the source of infection, particularly in hospitals and chronic care facilities. Several studies have demonstrated that the teeth of patients in the intensive care unit (ICU) become colonized by respiratory pathogens.⁵⁵ These pathogens mix with saliva and oral bacteria and are subsequently aspirated into the lungs. One ICU study demonstrated that only patients who had respiratory pathogens located in dental plaque developed pneumonia.⁵⁶

A recent retrospective evaluation of the NHANES III (National Health and Nutrition Examination Survey) data suggests an association between periodontal attachment loss and chronic obstructive pulmonary disease (COPD).⁵⁷ COPD includes diseases such as chronic bronchitis and emphysema that are characterized by obstruction of the airway and excess mucus production.

The possibility that a relationship exists between periodontal bacteria and respiratory infection clearly indi-

cates the importance of maintaining good oral hygiene for institutionalized patients. Studies have demonstrated that daily mechanical oral hygiene with or without use of a chemotherapeutic rinse—such as 0.12 per cent chlorhexidine gluconate or 1 per cent povidine iodine—reduces both pathogenic oral bacterial colonization and the rate of pneumonia by approximately 50 per cent.⁵⁶ This information clearly justifies the need for employment of dental hygienists in long-term care facilities.

Periodontitis and cardiovascular disease

It has long been recognized that a relationship exists between the heart and periodontal pathogens. We all know from our basic studies in dental hygiene that there are certain individuals with valvular heart disease who are inherently at risk for the development of infective endocarditis. We also have been taught that these individuals require prophylactic antibiotic premedication prior to undergoing invasive procedures that result in soft-tissue bleeding. The American Heart Foundation in 1997 stratified risk categories into high, moderate, and negligible with prophylactic coverage recommended for those in the high/moderate risk groups. Thus dental hygienists are well educated to prudently assess each client's medical history to identify those at-risk individuals. It must, however, be recognized that antibiotics will not preclude infective endocarditis; they only minimize the risk.

The possibility that a relationship exists between periodontal bacteria and respiratory infection clearly indicates the importance of maintaining good oral hygiene for institutionalized patients.

With this strong history of association between cardiovascular disease and periodontal microorganisms, it should not be a surprise that further linkages have been suggested. Cardiovascular disease and periodontal disease have multiple similarities. Shared risk factors such as smoking, age, gender, stress, and socio-economic status have long been recognized. Additionally, it is becoming evident that chronic inflammation and infection such as periodontitis influence the atherosclerotic process.⁵⁸ Atherosclerosis is the result of fibrolipid deposition in large and medium arteries that reduces the size of the lumen of the blood vessels and predisposes them to obstruction, thrombosis, and ischemia. In the presence of infections such as periodontitis, proinflammatory cytokines such as interleukin-1 and tumor necrosis factor-alpha may exert systemic effects predisposing the individual to atherosclerosis.⁵⁶ Some of the proposed mechanisms suggested that may link oral infections to systemic disease are spread of infection as a result of transient bacteremia, injury from the effects of circulating oral microbial toxins, and metastatic inflammation

caused by an injury induced by oral microorganisms. Oral bacteria that have been implicated are *Streptococcus sanguis* and *Porphyromonas gingivalis*.⁵⁶

Mattila's group² was the first to note an association between periodontal disease and cardiovascular disease in 1989. Their first study reported an odds ratio of 1:3 for the association between poor dental health and myocardial infarction. This relationship occurred independently of other known risk factors such as smoking. Subsequent studies by the same researchers continued to show similar associations between cardiovascular disease and oral infections, including periodontitis.^{59,60} DeStefano et al,⁶¹ in the first longitudinal National Health and Nutrition Examination Survey (NHANES I), assessed periodontitis with a periodontal index. Their results revealed a 25 per cent increase in risk for coronary heart disease in patients with periodontal disease compared with patients with minimal disease. Additionally, a study of a population of Gila River Indians by Genco and colleagues⁶² demonstrated that individuals older than 60 years with periodontal bone loss were 2.68 times more likely to develop cardiovascular disease after adjusting for gender and duration of diabetes. In 1996, Beck⁶³ and co-workers described an association between alveolar bone loss and coronary artery disease and stroke. Studies further investigating this finding were conducted at Columbia University. Results from two separate studies found an association between poor periodontal health and stroke.^{64,65} Following these initial investigations, numerous other studies have been conducted, including a Nutrition Canada survey⁶⁶ in which gingivitis was associated with an increase in fatal myocardial infarction risk. Although these studies had varying results, all imply some sort of relationship between periodontitis and cardiovascular disease.

Evidence is building to validate a bi-directional relationship with a number of systemic diseases such as diabetes, preterm low-birth-weight babies, respiratory disease, and cardiovascular disease.

More recently, results were published of a prospective study of 8,032 people from the NHANES I⁶⁷ longitudinal study that followed these individuals for a 17-year period. This study did not reveal a relationship between cardiovascular disease and periodontitis. More specifically, elimination of dental infections did not reduce the risk of coronary artery disease. This finding argues against a causal relationship between periodontitis and heart disease and is in direct conflict with previously reported findings.

All of the studies to date investigating a relationship between periodontitis and cardiovascular disease are dif-

ficult to validate. Suggested flaws in study design have been reported such as the inability to differentiate between the various risk factors and the inability to acquire standardized data for periodontal infections for baseline and sequential analysis.⁶⁸ The range of available studies is composed primarily of cross-sectional, case-control, and prospective studies rather than the randomized controlled clinical trials required for Level 1 evidence. Additionally, the lack of consistency in periodontal indices and in study design prohibits more rigorous analysis of these studies through meta-analysis (i.e., Cochrane review). This makes it difficult to interpret these findings in a truly evidence-based fashion. Until this type of evidence is made available, a causal relationship between periodontal disease and cardiovascular disease cannot be established.

Conclusion

It is apparent from this review that a number of systemic conditions, such as diabetes mellitus and smoking, are risk factors for periodontal disease with other conditions such as various medications and human immunodeficiency virus infection having oral manifestations. Conditions such as osteoporosis, menopause, and stress have strong preliminary evidence suggesting a possible risk relationship. However, this has not yet been substantiated. On the other hand, evidence is building to validate a bi-directional relationship with a number of systemic diseases such as diabetes, preterm low-birth-weight babies, respiratory disease, and cardiovascular disease. Evidence of causality must be established through appropriately designed randomized controlled trials or meta-analyses of similarly designed longitudinal studies. Until those studies become available, one can only speculate on a cause-and-effect relationship. It is unknown at this time whether this relationship truly exists. It has been suggested that periodontitis is not a risk factor at all for cardiovascular disease; however, inflammation appears to be gaining increasing importance in the etiology of heart disease.⁶⁹ Perhaps the relationship between these systemic diseases and periodontitis is the fact that periodontitis is an infection and infectious agents found in the mouth could feasibly induce systemic changes. Studies have shown that oral bacteria such as *Streptococcus sanguis* and *Porphyromonas gingivalis* can express a collagen-like platelet aggregation-associated protein that can stimulate thrombosis.⁷⁰ To further support an infectious cause for cardiovascular disease, other non-periodontal infectious agents such as *Chlamydia pneumoniae*, *Helicobacter pylori*, Cytomegalovirus, and herpes simplex virus have been detected in atheromas.⁷¹ Additionally, the liver produces C-reactive proteins in response to inflammation and these proteins are present in several of these systemic conditions such as myocardial infarction. However, it has been demonstrated that periodontal treatment can reduce serum levels of C-reactive protein⁷² that in turn has been shown to reduce the risk of myocardial infarction.⁷³ Perhaps there is a relationship after all.

This new frontier of periodontal medicine is just in its infancy of discovery. It is critical that all health care providers, both medical and oral, stay abreast of new emerging data in order to provide their clients with the most current and accurate information on the relationship between periodontal and systemic conditions. It is important to interpret the information appropriately and not to jump to conclusions with causal relationships that may or may not exist. It is a real possibility that improving our clients' oral health may reduce the likelihood of the development of serious systemic conditions. The medical-dental interface is truly a reality.

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Periodontal Disease Linked to Pre-term, Low-Birth-Weight Infants

ABSTRACT

There is an increasing number of systemic conditions that appear to be linked to the presence of periodontal disease. Recent studies have examined the correlation between periodontal disease and pre-term, low-birth-weight infants. Most low-birth-weight infants are pre-term, require more health care services than normal-weight infants, and suffer long-term health problems such as reduced cognitive skills and retarded physiological growth. Dental hygienists need to be aware of this correlation in order to prevent and/or treat periodontal disease in women of childbearing age.

A search of MEDLINE over a 20-year period was conducted to locate studies about potential factors related to a correlation between periodontal disease and pre-term, low-birth-weight babies. The search resulted in approximately 35 articles. Additional references were obtained through references in articles. The objective of the research was to prepare a literature review.

The literature revealed that while genital tract infections explained some pre-term, low-birth-weight infants, it was postulated that the remainder could possibly be the result of a subclinical infection located at a site distant from the urogenital area. Researchers began to focus on the oral cavity as the next most logical site for a maternal subclinical infection. In studies conducted on hamsters and other small rodents, it was found that chronic exposure to a pathogenic microorganism was related to lower fetal birth weight, aborted or resorbed fetuses, and death. In human studies, loss of periodontal attachment, increased periodontal disease sites, and increased bleeding sites were greater in mothers who gave birth to low-birth-weight infants. A correlation was also found between increased levels of Prostaglandin E2 (PGE-2) in gingival crevicular fluid (GCF) and decreased birth weight in subjects.

It is important to note that at this time it is a correlation, not a cause-and-effect relationship, that links periodontal disease to pre-term, low-birth-weight infants. Dental hygiene clinicians must not overlook the possibility that periodontal disease in women may result in pre-term, low-birth-weight infants and must alert their female clients to this possible correlation. However, additional research is needed to establish a definitive link between periodontal disease and pre-term, low-birth-weight infants.



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Introduction

As oral health professionals, dental hygienists have a responsibility to their clients to be aware of various systemic complications that may arise as a result of periodontal disease. Dental hygienists have utilized this knowledge in the past when it was discovered that invasive dental procedures, such as scaling, could initiate bacterial endocarditis in a client who is deemed to be at risk for developing the condition. As new information becomes available, there is an increasing number of health concerns that appear to be linked to poor periodontal health. One of the most recent correlations studied is maternal periodontal disease and pre-term, low-birth-weight infants.

A MEDLINE search over a 20-year period was conducted to provide a literature review that examines this recent correlation. It is a relatively new idea with few human clinical studies but the preliminary data suggest that periodontal disease could be an additional risk factor for a pre-term, low-birth-weight infant.

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Incidence and etiology of low-birth-weight infants

In 1950, the World Health Organization defined low birth weight as a child born weighing less than 2500 g and defined a pre-term infant as a child born prior to 36 weeks of gestation.¹ Thus, a pre-term, low-birth-weight (PLBW) infant weighs less than 2500 g and is born prior to 36 weeks gestation. In 1984, the World Health Organization undertook a review to determine the worldwide incidence of PLBW infants. In this review, it was determined that "in countries where the proportion of LBW [low-birth-weight] infants is low, most of them are pre-term."² Countries with a relatively low incidence of LBW infants include the United States of America and Canada.² Thus a woman who gives birth prematurely in these countries is likely to have a low-birth-weight infant. Low-birth-weight infants initially require more care than full-term, normal-weight infants. This may include additional staff on hand at the birth, use of extensive resuscitative equipment, and longer hospital stays for the infant. In addition, many may have long-term health problems such as reduced cognitive skills and retarded physiological growth. Thus a search was initiated to determine the etiology of pre-term labour so that it may be prevented, and in turn prevent a low-birth-weight infant.

The majority of studies to determine a specific etiology for PLBW infants looked at the overall health of the mother and in particular at the health of the mother's urogenital tract.³⁻⁵ It was postulated that a maternal urogenital tract infection could induce pre-term labour³⁻⁵ and this gave researchers new insights into risk factors for PLBW infants. Many pre-

term births have historically been associated with, or directly linked to, various risk factors such as smoking, prior pre-term birth, and low maternal pre-pregnancy weight.⁶ However, Davenport et al⁷ report that there is "a high proportion of PLBW cases [that] have an unexplained etiology." Offenbacher et al⁸ also state that one quarter of mothers who give birth prematurely to a LBW infant possess none of the traditional contributory risk factors for PLBW infants. The incidence of unexplained etiology for PLBW infants has prompted researchers to look for additional risk factors that could contribute to pre-term labour. Although genital tract infections provided an explanation for some PLBW infants, they could not explain the remainder of cases with an unknown etiology. It was postulated that the remainder of these PLBW cases could possibly be the result of a subclinical infection located at a site distant from the mother's urogenital area.

Subclinical infection and pre-term birth

The initiation of labour in humans is a complex process involving a multitude of hormones and similar chemicals.⁹ There has been a substantial investigation into the roles of these hormones in the process of labour initiation and progression. Prostaglandins have been studied extensively. A prostaglandin is defined as "any group of hormone-like fatty acids found throughout the body that affect blood pressure, metabolism, body temperature, and other important body processes."¹⁰ It has been determined that these hormone-like substances provide a cue for the initiation and progression of human labour.^{3,6,9,11} Prostaglandin E₂ (PGE-2) has been singled out as one of the more significant prostaglandins involved throughout pregnancy and in labour initiation.⁶ Romero et al¹¹ studied amniotic fluid levels of PGE-2 and determined that this substance increases prior to the initiation of labour. Offenbacher et al⁶ note not only that does PGE-2 increase dramatically prior to the onset of labour, but also that it will increase steadily throughout a woman's pregnancy. It is postulated that the level of PGE-2 will increase until a "critical threshold level is reached" in order to begin labour.⁶ It has been determined that PGE-2 levels will rise by 50 per cent in human labour,⁹ which suggests a link between PGE-2 levels and human labour. Animal studies also point to increasing PGE-2 levels throughout pregnancy. Collins et al¹² found that in hamsters, PGE-2 levels increased in amniotic fluid as pregnancy progressed.

Although the levels of PGE-2 appear to rise throughout pregnancy as a normal activity in order to initiate labour, an abnormal increase could induce labour prematurely. A potential stimulus for increased PGE-2 production is a maternal bacterial infection. It has been noted frequently in the literature that maternal genital tract infections have been implicated in a substantial number of pre-term labour cases.^{13,14} One study indicated that the shift in bacterial flora from the primarily dominant *Lactobacilli* species to a mix of gram negative bacteria could result in bacterial vaginosis,¹⁴ a relatively common vaginal infection. This shift may produce a host immune response that results in the release of prostaglandins and cytokines.^{13,14} Romero et al³ have demonstrated that bacterial endotoxin, notably lipopolysaccharide (LPS), was responsible for the significant increase in



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Conference Program and Registration Form



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14th Annual Professional Conference
Regina, Saskatchewan
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Program Outline

Friday, June 20, 2003

The Regina Inn, Regina, Saskatchewan

- 1:30 p.m. to 3 p.m. Registration desk open in Main Lobby for delegate registration
- 3 p.m. to 5 p.m. Opening ceremonies at the Regina Inn (room to be announced)
- 5 p.m. to 6:30 p.m. Registration desk open in Main Lobby for delegate registration
- 5 p.m. to 7 p.m. Free time – delegates to arrange their own dinner plans
- 7 p.m. to 8:30 p.m. President's Welcome Reception at the Casino Regina Show Lounge
- 8:30 p.m. Doors to Show Lounge open for evening's entertainment; show will commence at 9 p.m.

Saturday, June 21, 2003

The Regina Inn, Regina, Saskatchewan

- 7:30 a.m. to 8:30 a.m. Continental breakfast on Main Level
Registration desk open in Main Lobby for delegate registration

8:30 a.m. to 10 a.m. **KEYNOTE PRESENTATION**

Speaker: Kristine A. Hodsdon, RDH, BS

Sponsor: Oral-B

Saturday Keynote Presentation Topic:

Obstacles Are Only Those Things We See When We Take Our Eyes Off Our Goal

Summary: Kristine Hodsdon will help us re-examine our role in the hygiene profession through a joyful and heartfelt presentation. There are steps we can take to gain control of our reputation and professional image, most of which are easily accomplished and will have a dramatic effect on all areas of our lives.

Biography: Since 1989, Kristine A. Hodsdon, RDH, BS, has been changing the landscape of dental hygiene. She is the author of a collaborative book, *Demystifying Smiles: Strategies for the Dental Team*, an international speaker, developer of the software Pre-D Systems™, and editor of the *Hygiene Mastery*™ magazine. Ms. Hodsdon is a frequent contributor to dental industry publications including *RDH* magazine, *Dental Economics*, and the *Journal of Cosmetic Dentistry*. She is a member of the American Dental Hygienists Association (ADHA) and the American Academy of Cosmetic Dentistry (AACD), has served on New Hampshire's state dental regulatory board, and continues to serve on a variety of industry advisory boards and panels.

10 a.m. to 10:30 a.m. **Nutritional break on Main Level**

10:30 a.m. to 12 noon **Concurrent sessions**



Expanding Horizons

14th Annual Professional Conference
Regina, Saskatchewan
June 20-22, 2003

Speaker: Kristine A. Hodsdon, RDH, BS

Sponsor: Oral-B

Topic: **The Esthetic Hygienist**

Summary: In a continued effort to support patients' restorative dentistry, hygienists must learn to shift from their comfort zone of periodontics and refocus on restoration. The key areas of this talk include how total health issues can affect esthetics, functional reasons for esthetic dentistry, basic smile design principles, post-restorative protocols, and enrolment skills.

Biography: Please see above

Speaker: Susan Isaac, RDH, BScD, MEd

Sponsor: Philips Oral Healthcare

Topic: **Oral Health through the Golden Years**

Summary: Ageing is a complex and fascinating process. Having a personal understanding of your own and others' ageing process will enhance your ability to work effectively with friends, family, and clients. This course will focus on the biological, physiological, and psychological changes that occur as we age and provide key strategies to utilize in your dental practice. Various clinical aspects of seniors will be discussed, as well as a product review for specific treatments.

Biography: Susan Isaac has 23 years' experience both working in various practice settings and teaching. She has held faculty positions at George Brown College and St. Clair College in Ontario and Camosun College in British Columbia. Susan has designed and taught courses on Geriatric Dentistry and has had many rewarding years of clinical experience working with seniors. Ms. Isaac is a member of the British Columbia Dental Hygienists' Association (BCDHA), CDHA, and Dental Hygiene Educators of Canada (DHEC). She is currently a member of the Awards and Scholarship Committee for DHEC.

Speaker: Patricia M. Johnson, PhD, RDH

Topic: **Dental Hygiene in Canada: Patterns, Trends, and Changes**

Summary: This presentation will review the paper prepared by Ms. Johnson that reports the findings of a national survey undertaken in 2001 to investigate the characteristics and deployment of dental hygienists in Canada. Of particular interest are patterns of clinical practice and personal, occupational, and work-related factors associated with those patterns. Trends and changes over the past 12 years, and in some cases 20 years, are also examined. Implications of the study's findings for the dental hygiene profession and for planning, for example, human resource requirements to meet oral health needs and demands are considered.

Registration Information Fee structure (GST included)

Category	Full Registration		Daily Registration	
	Early Bird	After May 23, 2003	Early Bird	After May 23, 2003
CDHA Member	\$318.00	\$371.00	\$212.00	\$265.00
Non-Member (Hygienist)	\$636.00	\$689.00	\$424.00	\$530.00
Allied Health Professional	\$386.90	\$439.90	\$280.90	\$333.90
Student	\$79.50	\$79.50	\$79.50	\$79.50

Please note:

- Participation is by advance registration only.
- Early Bird registration closes 5 p.m. Eastern Time, Friday, May 23, 2003.
- Conference registration closes 5 p.m. Eastern Time, Wednesday, June 11, 2003.

Full registration includes:

- Admission to Opening Ceremonies at the Regina Inn, the President's Welcome Reception and Show Lounge performance at Casino Regina on Friday evening
- Admission to speakers' presentations on Saturday and Sunday
- Continental breakfast, nutritional breaks, and lunch on Saturday and Sunday
- Saturday Evening Gala at Applause Feast & Folly Dinner Theatre
- Town Hall meeting
- Closing Ceremonies

Daily registration includes:

- **Friday:** Admission to the Opening Ceremonies at the Regina Inn, the President's Welcome Reception and Show Lounge performance at Casino Regina
- **Saturday:** Admission to speakers' presentations, continental breakfast, nutritional breaks, and lunch (*Note: The daily registration fee does not cover admission to the Saturday Evening Gala at Applause Feast & Folly Dinner Theatre; tickets must be purchased separately.*)
- **Sunday:** Admission to Town Hall meeting, speakers' presentation, continental breakfast, nutritional break, Closing ceremonies, and lunch

Cancellation Policy

If cancellation notice is received, in writing, at the CDHA office prior to 5 p.m. Eastern Time Friday, May 23, 2003, registration fees will be reimbursed in full, less a \$25.00 administration fee. After 5 p.m. Eastern Time, Friday, May 23, 2003, a 50% refund will be issued upon receipt of written cancellation at the CDHA office, less a \$25.00 administration fee. No refunds will be issued after 5 p.m. Eastern Time Wednesday, June 11, 2003. Please note that if payment was made by personal cheque, refunds will be issued only when the bank has confirmed clearance of payment; this can take from one to three months. Any payment returned NSF will also be charged a \$25.00 administration fee.

Hotel Information

The CDHA has reserved a block of rooms at the Regina Inn for conference delegates. Hotel accommodations are the responsibility of the participant. To reserve your room, please contact the Regina Inn directly at its toll-free number, 1-800-667-8162, and ask for the CDHA Conference Rate.

Please note: Rooms will be available at the conference rate until **May 19, 2003**. After May 19, 2003, delegates will be required to pay regular room rates.

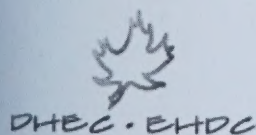
Travel Information

Air Canada has issued a convention number for discounts on air fares. Call Uniglobe Travel at 1-800-267-9372, extension 420, and quote our Convention Number, **030083**. The discounts range from 5% off the reduced Saturday night stay tickets (not valid on advertised seat sales) to 35% off the full-fare tickets (at least 7 days advance purchase needed).

Special Needs?

Do you have special needs/requirements that we should be aware of? If you do, please ensure you complete the Special Needs section of the registration form.

Dental Hygiene Educators of Canada / Éducateurs en Hygiène dentaire du Canada



Events in Conjunction with the CDHA Conference in Regina in June 2003

DHEC / EHDC Annual General Meeting

Mark your calendars for Friday, June 20, to attend the DHEC/EHDC Annual General Meeting at the Regina Inn, Regina, Saskatchewan, from 1 p.m. to 2 p.m. prior to the CDHA Opening Ceremonies.

DHEC / EHDC Summit on Dental Hygiene Education

The Summit will commence after the CDHA Conference on Sunday, June 22, from 3 p.m. to 6 p.m. and will continue on Monday, June 23, from 8:30 a.m. until 4 p.m. The purpose of the Summit is to advance the CDHA policy on baccalaureate dental hygiene education as the entry-to-practice credential. Everyone is welcome to attend.

For more information about registration, contact Margaret Wilson at <mpwilson@ualberta.ca>. Also check our web site at <www.dhec.ca> or contact Susanne Sunell at <ssunell@idmail.com> for further information about the Summit.



Registration Form

PLEASE PRINT OR TYPE. One form per registrant. Photocopies accepted.

I am a CDHA Member ☐ Yes ☐ No Membership Number: _____

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PGE-2 production. These same researchers postulated that direct contact of LPS with amniotic epithelium could be sufficient to stimulate the maternal immune system to produce more prostaglandins, which could subsequently result in labour initiation.³ Another study⁴ has shown that a woman who has both pre-term labour and an intra-amniotic infection will have significantly higher levels of PGE-2 within the amniotic fluid. Collins et al¹² associate these increased levels of PGE-2 with so-called "abnormal pregnancy outcomes" in studies conducted with hamsters. Such outcomes included decreased birth weight.

Two additional inflammatory mediators have been isolated as possible contributing factors for pre-term labour: interleukin-1 (IL-1), particularly interleukin-1 β (IL-1 β); and tumour necrosis factor α (TNF α). Romero et al¹⁵ have shown women who have an infection and pre-term labour had a significant increase in "IL-1-like activity." Alternatively, a woman who presented with only pre-term labour and no infection demonstrated a lack of "IL-1-like activity."¹⁵ Of significance to this finding is the lack of IL-1-like activity in second-trimester samplings; IL-1-like activity was found in third-trimester samplings.¹³ This provides a strong indication that IL-1 may be involved in human labour initiation when an infection is present. The cytokine TNF α has not been involved in premature labour; rather, it has been implicated in retarded growth development of the fetus. Heyborne et al¹⁶ have demonstrated that elevated levels of TNF α tend to be associated with "impaired fetal growth." It is therefore possible that in the presence of infection, systemic increases in TNF α may result in a low-birth-weight infant.

A condition known as premature rupture of membranes (PROM) may also result in pre-term delivery. Women with this condition reach labour prematurely because the membranes are no longer able to sustain the fetus and its accompanying fluids. Schoonmaker et al⁵ have demonstrated that amniotic membranes may become weaker as a result of a bacterial challenge and neutrophil invasion. It is important to note that the combination of neutrophils and the bacterial challenge will produce a greater weakening of membranes when compared with the presence of neutrophils alone.⁵ This weakening of the membranes has been found to be a somewhat significant contributing factor for the pre-term birth of an infant.⁵

Although female genital tract infections appear to play a significant role as a major risk factor for pre-term birth, there has been only a minor reduction in pre-term labour when these infections were treated.¹³ It is also interesting to note that some pre-term, low-birth-weight infants were born where no amniotic fluid or placental infection could be detected.^{7,12,13}

Periodontal disease and pre-term labour

Puzzled by the lack of infection surrounding the developing fetus and maternal genital tract, researchers looked to the next most logical source that could account for a maternal subclinical infection—the oral cavity. As dental hygienists, we are all too familiar with the vast array of micro-organisms that inhabit the oral cavity. We are also aware that these

organisms may enter an individual's bloodstream either through invasive oral procedures or passively through the inflamed and friable periodontal pocket wall. The subsequent invasion of micro-organisms into an individual's bloodstream is known to result in bacterial colonization outside of the oral cavity, a colonization that may lead to infective endocarditis in susceptible individuals.¹⁷ Is it possible, then, that these same micro-organisms could have some kind of effect on a woman's pregnancy outcome? The host response to genital tract infections and to pathogenic oral microflora will involve similar inflammatory mediators. Intra-amniotic fluid or placental infections stimulate the host's immune system to release PGE-2, TNF α , and IL-1 β .^{6,12} The same cytokines and prostaglandins involved in pre-term labour and intra-amniotic infection are also released during active periodontal disease.^{6,7} Heasman et al¹⁸ have shown that by day 28 of experimental gingivitis in humans, the gingival crevicular fluid (GCF) levels of IL-1 β and PGE-2 have increased dramatically and consistently throughout the 28-day trial. The IL-1 β levels rose from 16.5 ± 9.3 ng/ml to 131 ± 76.0 ng/ml by day 21 of the study, while PGE-2 levels rose from 20.5 ± 7.6 ng/ml to 53.5 ± 5.2 ng/ml at day 28 of the trial.¹⁸ A curious and unexpected result of the study was the noticeable absence of TNF α within the GCF. However, in contrast, Davenport et al⁷ have shown elevated systemic levels of TNF α in patients with active periodontal disease.

A number of studies to determine if oral bacteria could have some kind of effect on pregnancy outcome have been conducted on hamsters and other small rodents. These studies have shown that a bacterial challenge with *Porphyromonas gingivalis* produced lower fetal birth weight and, curiously, an increase in aborted or resorbed fetuses.^{12,19} Collins et al¹⁹ looked at outcomes in pregnant hamsters after the rodents were specifically inoculated with *P. gingivalis*. They found that repeated exposure to *P. gingivalis* resulted in much lower fetal weights and an increase in fetal death.¹⁹ It is interesting to note, and possibly quite significant, that those hamsters who had a single exposure to *P. gingivalis* did not have a dramatic decrease in fetal weight or an increase in fetal resorptions.¹⁹ Thus, chronic exposure to a pathogenic micro-organism may be necessary for the manifestation of adverse systemic outcomes.

A handful of human studies have looked at periodontal disease status among women who have had a PLBW infant. In one study by Offenbacher et al,⁸ the periodontal health of mothers who had given birth to a PLBW infant (cases) was compared with the periodontal health of mothers who gave birth to an infant weighing at least 2500 g at term (controls). The cases demonstrated an overall attachment loss of ≥ 3 mm and presented with a larger number of diseased sites throughout the mouth when compared with the controls.⁸ To eliminate bias in this study, examiners were trained individuals who used standardized techniques.⁸ Also of importance in this study is that examiners were blinded and did not know if they were looking at cases or controls when performing the periodontal assessment.⁸ Since there are a myriad of other risk factors for PLBW, for example smoking, these were taken into consideration when the data were analyzed.⁸ As a result, Offenbacher et al concluded that there

was a strong statistical association between attachment loss and low birth weight. This study appears to provide strong evidence that supports the correlation between periodontal disease and PLBW infants.

Dasanayake²⁰ conducted a similar study but looked only at the birth weight of the infant, disregarding the length of gestation. The periodontal assessments were blind so the examiners were not aware of the women's obstetric data.²⁰ As in the previous study, Dasanayake found that mothers who gave birth to a low-birth-weight infant demonstrated an increase in diseased and bleeding sites when compared with mothers who did not have a low-birth-weight infant.²⁰ The link between periodontal disease and low birth weight demonstrated in this study provides supporting evidence that poor periodontal health may be an additional risk factor for a low-birth-weight infant.

The aforementioned studies looked at clinical signs to determine if a link could be established between periodontal disease and a low-birth-weight infant. However, researchers wanted to determine if the inflammatory mediators found in GCF, which are involved with periodontal disease, could initiate adverse pregnancy outcomes, namely, PLBW infants. A study by Damare et al²¹ looked at the relationship between GCF levels of PGE-2, low birth weight, and amniotic fluid levels of PGE-2. A correlation between increased levels of PGE-2 within the GCF and decreased birth weight in subjects was found.²¹ Since PGE-2 levels in GCF are associated with an increase in periodontitis, this correlation supports the hypothesis that periodontitis could be an additional risk factor for low-birth-weight infants. Another interesting finding of this study was the correlation between GCF levels of PGE-2 and amniotic levels of PGE-2.²¹ These links could potentially allow for a non-invasive screening procedure, such as collection and analysis of GCF from pregnant women, to predict amniotic levels of PGE-2. If amniotic levels of PGE-2 could be predicted by way of measuring GCF levels, there is great potential to prevent premature labour. However, this is the only study that demonstrates a correlation between PGE-2 levels in GCF and PGE-2 levels in amniotic fluid. Additional studies in this area need to be conducted to support the correlation found by this group of researchers.

It is important to note in the above studies that a correlation, not a cause-and-effect relationship, was detected between periodontal disease and PLBW infants. It would therefore be inappropriate to state that periodontitis causes pre-term labour. In addition, other systemic conditions that may be contributing risk factors for premature labour should also be explored. For example, Mitchell⁹ and Offenbacher et al⁶ have suggested that a woman may be susceptible to pre-term labour as well as periodontal disease. It has been speculated that an "altered inflammatory trait" may be responsible for an increased risk of periodontitis and an increased risk of premature labour.⁶ However, there are insufficient data available to support this possible link.

Conclusion

The possibility that generalized periodontal disease in women can result in PLBW infants cannot be overlooked. It has been estimated by one researcher⁸ that 18.2 per cent of pre-term births could be attributed to periodontal disease. This estimate seems relatively plausible as there are still a number of PLBW cases with unexplained etiology. In addition, if oral bacteria can be implicated in bacterial endocarditis, it is equally likely that the same bacteria could have an adverse effect on pregnancy outcomes. It is important to note that pathogenic oral microflora are not implicated as a direct cause of PLBW infants; rather, they provide a source of LPS that could stimulate the maternal immune response.⁸ This stimulation may provoke the amnion or placenta to produce inflammatory mediators that in turn could result in premature labour. An interesting analogy was presented by Offenbacher et al⁸ that supports the possible association between periodontal disease and PLBW:

The periodontium has a surface area that approximates the ventral surface of the human forearm. Logically, if the entire forearm were inflamed with gross suppuration and radiographic evidence of osteomyelitis, one would not be surprised if there were systemic sequelae. (p. 1111)

Dental hygienists in their role of educator are in an excellent position to discuss the potential threat that periodontal disease may have on a woman's pregnancy outcome. It is important that dental hygienists inform female clients that poor periodontal health may be an additional risk factor for PLBW infants. And unlike other risk factors such as previous pre-term birth, periodontal disease can be treated and prevented. Although the investigation into the correlation between periodontal disease and PLBW infants is only just beginning, initial evidence appears to support this relationship. However, additional research needs to be conducted before a definitive link between these two conditions can be made.

For now, as we await further research, dental hygienists must be aware of this apparent relationship between periodontal disease and PLBW and educate their clients about the importance of good oral health and its significance for healthy babies.

Acknowledgments

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"I HAVE A DREAM" (continued from page 51)

the profession. Our students want to explore all the possibilities their education can offer them. Our youth are choosing careers that offer them options for their future working lives. Two articles in the September/October 2002 issue of *Probe*—"Alternate Practice" by Melinda Ferguson and "Entrepreneurship" by Pat Spencer—should be read over and over to remind us all how valuable we are to improving the quality of life for Canadians.

I have a dream where governments and corporations support preventive oral health, creating an atmosphere where research and education are enhanced and the availability of continued education is broadened. As Roy Romanow said, "Keeping people well, rather than treating them when they are sick, is common sense. And so it is equally common sense for our health care system to place a greater emphasis on preventing disease and on promoting healthy lifestyles. This is the best way to sustain our health care system over the longer term. ... But we need more than rhetoric; we need action. I am therefore recommending a greater emphasis on prevention and wellness as part of an overall strategy to improve the delivery of primary care in Canada, the allocation of new moneys for research into the determinants of health, and that governments take the next steps for making Canadians the world's healthiest people."¹

Commissioner Romanow went even further by recommending that "the Health Council of Canada should review existing education and training programs and provide recommendations to the provinces and territories on more integrated education programs for preparing health care providers, particularly for primary health care settings."²

Let's hope our government picks up the ball on this so corporations will follow suit.

I have a dream where dental hygienists are politically active, working for a more equitable oral health care system. Our present-day "system" is fraught with problems, one of which is rural and remote access. Romanow recommends in his report that the government of Canada set up a Rural and Remote Access Fund to be used in part "to support innovative ways of delivering health care services to smaller communities and to improve the health of people in those communities."³ I can see hygienists as being ideal health care providers to make use of such a fund.

We have had many difficulties, roadblocks, and scars along the way as our profession has worked toward its dream. I heard a quote, "Take a scar and turn it into a star." Friends, some things are just worth fighting for, and in a battle most soldiers receive at least one scar to remind them of the fight. As I think about the changes occurring all around us, I am reminded of Martin Luther King Jr. when he said: "I say to you today, my friends, so even though we face the difficulties of today and tomorrow, I still have a dream."⁴

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New Classification of Periodontal Diseases

by Sandra Secord, RDH

A classification system allows clinicians to assign their clients to a category in the framework; this assists clinicians in the treatment of clients' specific health care needs. The classification system is based primarily upon the etiology and pathogenesis of the condition with which the client presents.

In 1997, the American Academy of Periodontology believed revisions to the current classification system of 1989 (see Table 1) were needed to rectify its shortcomings. These shortcomings included (1) an overlap in disease categories; (2) an absence of a gingival disease component; (3) an inappropriate emphasis on age of onset of disease and rates of progression; and (4) inadequate or unclear classification criteria.¹ The International Workshop for a Classification of Periodontal Diseases and Conditions was held on October 30 to November 2, 1999, for this purpose.

The following is a brief summary of an article in the December 1999 *Annals of Periodontology*, "Development of a

Classification System for Periodontal Diseases and Conditions."¹ Here an abbreviated version of the new 1999 classification of periodontal diseases is reviewed (see Table 2). Changes to the old classification will be looked at as well as the additions to the new 1999 system; a rationale for the modifications will be provided. The full version of the 1999 classification system (Table 3) can be found at the end of the article.

The discussion below follows the sequence of the new classification system shown in Table 2.

I. Gingival Diseases (addition in 1999)

This category of gingival diseases is the most comprehensive change in the classification system. The two major subcategories within this classification are (1) Dental plaque induced gingival diseases, and (2) Non-plaque-induced gingival lesions. These two classifications are further subdivided (refer to Table 3).

II. Chronic Periodontitis

(replaces Adult Periodontitis, 1989)

The replacement of this category was due largely to its definition: "onset after the age of 35." This was a problem because bone loss patterns can be found in people much younger than 35, even within the primary dentition. As with early-onset periodontitis, the age-dependent component of adult periodontitis requires the clinician to be cognitive of the client's previous dental history so the clinician can determine when the disease began. This is not always possible. The term "chronic" should not be interpreted as "noncurable."

III. Aggressive Periodontitis

(replaces Early-Onset Periodontitis, 1989)

Early-onset periodontitis was a term used to describe periodontal diseases that affected people under the age of 35, with significant attachment loss but little evidence of contributing local factors such as plaque and calculus. It was felt by the workshop participants that the age requirement was too restrictive, given that the same disease can occur in people over the age of 35. As well, the age factor requires the clinician treating a patient to have knowledge of the age when attachment loss was first observed; this is not always the case. Workshop participants decided that it would be wise to discard classification terminologies that were age-dependent or required knowledge of rates of progression.¹ The term "aggressive periodontitis" is applied to a person who is systemically healthy but diagnosis from clinical, radiographic, and historical findings reveals rapid attachment loss and bone destruction. Aggressive periodontitis is further subcategorized into localized and generalized forms and the severity of the disease entity. Generalized means more than

1977
I. Juvenile Periodontitis
II. Chronic Marginal Periodontitis
1986
I. Juvenile Periodontitis
A. Prepubertal
B. Localized juvenile periodontitis
C. Generalized juvenile periodontitis
II. Adult Periodontitis
III. Necrotizing Ulcerative Gingivo-Periodontitis
IV. Refractory Periodontitis
1989
I. Early-Onset Periodontitis
A. Prepubertal periodontitis
1. Localized
2. Generalized
B. Juvenile periodontitis
1. Localized
2. Generalized
C. Rapidly progressive Periodontitis
II. Adult Periodontitis
III. Necrotizing Periodontitis
IV. Refractory Periodontitis
V. Periodontitis Associated with Systemic Disease

Table 1. 1977, 1986, and 1989 classification systems²

Ms. Secord graduated as a dental hygienist from Algonquin College in 1992. At present, she is working in a general dentistry practice but has experience in a periodontal specialty office. She grew up in Niagara, attended Niagara College for dental assisting, but has been living in the Ottawa area for 11 years.

- I. Gingival Diseases**
 - A. Dental plaque-induced gingival diseases
 - B. Non-plaque-induced gingival lesions
- II. Chronic Periodontitis** (slight: 1-2 mm CAL; moderate: 3-4 mm CAL; severe: > 5 mm CAL)
 - A. Localized
 - B. Generalized (> 30% of sites are involved)
- III. Aggressive Periodontitis** (slight: 1-2 mm CAL; moderate: 3-4 mm CAL; severe: > 5 mm CAL)
 - A. Localized
 - B. Generalized (> 30% of sites are involved)
- IV. Periodontitis as a Manifestation of Systemic Diseases**
 - A. Associated with hematological disorders
 - B. Associated with genetic disorders
 - C. Not otherwise specified
- V. Necrotizing Periodontal Diseases**
 - A. Necrotizing ulcerative gingivitis
 - B. Necrotizing ulcerative periodontitis
- VI. Abscesses of the Periodontium**
 - A. Gingival abscess
 - B. Periodontal abscess
 - C. Pericoronal abscess
- VII. Periodontitis Associated with Endodontic Lesions**
 - A. Combined periodontic-endodontic lesions
- VIII. Developmental or Acquired Deformities and Conditions**
 - A. Localized tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis
 - B. Mucogingival deformities and conditions around teeth
 - C. Mucogingival deformities and conditions on edentulous ridges
 - D. Occlusal trauma

Table 2. Abbreviated version of the 1999 classification of periodontal diseases²

30 per cent of sites are involved; the severity is based on the amount of clinical attachment loss: slight (1-2 mm CAL), moderate (3-4 mm CAL) or severe (>5mm CAL).²

IV. Periodontitis as a Manifestation of Systemic Diseases (expansion of category)

In the new classification system, this category has been further subclassified and expanded. It now includes three sub-categories based on the etiology of the systemic disease. The first category deals with hematological disorders (diseases of the blood/blood disorders). The second deals with diseases associated with genetic disorders. Genetic disorders include Down syndrome, Papillon-Lefèvre syndrome, etc. The third category deals with systemic diseases not otherwise specified in the first two categories. Treatment and the management of periodontal diseases as a complication of a systemic disease should be carried out in conjunction with the treatment of the systemic disease.

V. Necrotizing Periodontal Diseases (replaces Necrotizing Ulcerative Periodontitis, 1989)

The 1989 category classification was expanded and now includes not only necrotizing ulcerative periodontitis (NUP) but also necrotizing ulcerative gingivitis (NUG). The apparent difference is that NUG is restricted to the tissues of the

gingiva and NUP extends into the periodontal attachment. Both diseases appear to be related to diminished systemic resistance to bacterial infection.² The two diseases can be distinguished from one another clinically but the workshop participants were unsure if the two conditions are indeed separate diseases or part of a disease process. In future revisions, these diseases may be separated into individual classifications. It is worth noting that necrotizing periodontal diseases can also be a manifestation of a systemic disease or be an adjunctive development from emotional stress or smoking.

VI. Abscesses of the Periodontium (addition in 1999)

This category is further subcategorized into the location of the abscess: (1) Gingival abscesses (localized to gingival tissues); (2) Periodontal abscesses (infection of pocket in the presence of pre-existing periodontitis); (3) Pericoronal abscesses (infection of erupting or partially impacted teeth). Abscesses were included under their own disease classification because although they are the result of periodontitis, they require specific diagnosis and treatment.

VII. Periodontitis Associated with Endodontic Lesions (addition in 1999)

This is not a new disease. However, as it was not included in the 1989 classification system, it has been included in the revised one. This classification deals with the connection between periodontitis and endodontic lesions but does not differentiate between the two in terms of the etiology of the lesion.

VIII. Developmental or Acquired Deformities and Conditions (addition in 1999)

This category contains four sub-classifications: (1) Localized tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis (overhangs); (2) Mucogingival deformities and conditions around teeth (clefts, hyperplastic, recession etc.); (3) Mucogingival deformities and conditions on edentulous ridges; and (4) Occlusal trauma.

Elimination of Refractory Periodontitis (1989)

Workshop participants believed that refractory periodontitis was a result of many factors prior to treatment and was not a separate disease. Refractory periodontitis is the continuation of attachment loss despite proper oral hygiene and clinical treatment. Factors affecting refractory periodontitis include smoking, microflora, extent of disease progression prior to treatment (furcation involvement), and type of treatment provided.

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I. Gingival Diseases A. Dental plaque-induced gingival diseases (gingival diseases affecting the periodontium with no attachment loss or attachment loss that is not progressing.) - Gingivitis associated with dental plaque only - without other local contributing factors - with local contributing factors (See VIII A) - Gingival diseases modified by systemic factors - associated with the endocrine system - puberty-associated gingivitis - menstrual cycle-associated gingivitis - pregnancy-associated - gingivitis - pyogenic granuloma - diabetes mellitus-associated gingivitis - associated with blood dyscrasias - leukemia-associated gingivitis - other - Gingival diseases modified by medications - drug-influenced gingival diseases - drug-influenced gingival enlargements - drug-influenced gingivitis - oral contraceptive-associated gingivitis - other - other B. Non-plaque-induced gingival lesions - Gingival diseases of specific bacterial origin - Neisseria gonorrhea-associated lesions - Treponema pallidum-associated lesions - streptococcal species-associated lesions - other - Gingival diseases of viral origin - herpes virus infections - primary herpetic gingivostomatitis - recurrent oral herpes - varicella-zoster infections - other	- Gingival diseases of fungal origin - Candida-species infections - generalized gingival candidosis - linear gingival erythema - histoplasmosis - other - Gingival lesions of genetic origin - hereditary gingival fibromatosis - other - Gingival manifestations of systemic conditions - mucocutaneous disorders - lichen planus - pemphigoid - pemphigus vulgaris - erythema multiforme - lupus erythematosus - drug-induced - other - allergic reactions - dental restorative materials - mercury - nickel - acrylic - other - reactions attributable to - toothpastes/dentifrices - mouthrinses/ mouthwashes - chewing gum additives - foods and additives - other - Traumatic lesions (factitious, iatrogenic, accidental) - chemical injury - physical injury - thermal injury - Foreign body reactions - Not otherwise specified (NOS) II. Chronic Periodontitis - Localized - Generalized III. Aggressive Periodontitis - Localized - Generalized IV. Periodontitis as a Manifestation of Systemic Diseases - Associated with hematological disorders - Acquired neutropenia - Leukemias - Other - Associated with genetic disorders - Familial and cyclic neutropenia - Down syndrome - Leukocyte adhesion deficiency syndromes - Papillon-Lefèvre syndrome - Chédiak-Higashi syndrome	- Histiocytosis syndromes - Glycogen storage disease - Infantile genetic agranulocytosis - Cohen syndrome - Ehlers-Danlos syndrome (Types IV and VIII) - Hypophosphatasia - Other C. Not otherwise specified (NOS) V. Necrotizing Periodontal Diseases - Necrotizing ulcerative gingivitis (NUG) - Necrotizing ulcerative periodontitis (NUP) VI. Abscesses of the Periodontium - Gingival abscess - Periodontal abscess - Pericoronal abscess VII. Periodontitis Associated With Endodontic Lesions - Combined periodontic-endodontic lesions VIII. Developmental or Acquired Deformities and Conditions - Localized tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis - Tooth anatomic factors - Dental restorations/ appliances - Root fractures - Cervical root resorption and cemental tears - Mucogingival deformities and conditions around teeth - Gingival/soft tissue recession - facial or lingual surfaces - interproximal (papillary) - Lack of keratinized gingiva - Decreased vestibular depth - Aberrant frenum/muscle position - Gingival excess - pseudopocket - inconsistent gingival margin - excessive gingival display - gingival enlargement - Abnormal color - Mucogingival deformities and conditions on edentulous ridges - Vertical and/or horizontal ridge deficiency - Lack of gingiva/keratinized tissue - Gingival/soft tissue enlargement - Aberrant frenum/muscle position - Decreased vestibular depth - Abnormal color - Occlusal trauma - Primary occlusal trauma - Secondary occlusal trauma
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Table 3. 1999 classification system for periodontal diseases and conditions¹

References

- Dental, Infections [on-line]: <www.emedicine.com/emerg/topic128.htm>
- Merck Manual of Diagnosis and Therapy [on-line]: Teeth and Periodontium. Section 9, Chapter 106. [Cited November 2002.] <www.merck.com/pubs/mmanual/section9/chapter106/106f.htm>
- Rethman, M., and Rethman, J.: Perception vs reality: success in periodontal therapy. Advanced Development Seminars, April 28, 2000, Toronto, ON
- University of Minnesota School of Dentistry [on-line]: <www1.umn.edu/perio/periocasepresent/text/resource.html>
- Western Society of Periodontology [on-line]: <www.dent.ucla.edu/pic/members/wsp/4-96/>

Professor Michele Darby is the graduate program director at Old Dominion University's School of Dental Hygiene in Norfolk, Virginia. She is one of the few faculty members at the university who have earned the title of Eminent Scholar.

The briefest glance at her background reveals why she deserves such an honour. She is not only the author of more than 50 scholarly articles but has also published three books, beginning with *Research Methods for Oral Health Professionals*, co-authored with Denise Bowen. Her second book, *Comprehensive Review of Dental Hygiene*, is now in its fifth edition. Her third book, the definitive *Dental Hygiene Theory and Practice*, which she co-authored with dental hygiene scholar Margaret Walsh, was published in 1995; a second edition will appear in 2003.

But Professor Darby is a teacher as well as a scholar. After serving as an Instructor of Dental Hygiene at Columbia University from 1972 to 1974, she joined the faculty of Old Dominion University's School of Dental Hygiene. She was the department's chair for 7 years and for the past 17 has served as its graduate program director. She is deeply involved with her students' education and with the issues that will face them in their professional lives.

We spoke recently with Professor Darby about the future of dental hygiene, about the changes the profession is likely to undergo, and about the preparation that its students will need to deal with the challenges and opportunities of the next 10 years.

Q: What inspired you to shift the paradigm for dental hygiene practice from a biomedical approach to the human needs approach and to construct the Human Needs Conceptual Model?

We wanted to develop a model that would unify the elements of practice important to most dental hygienists. For example, most of us view clients holistically and humanistically, seeing them as co-therapists actively involved in the process of care.

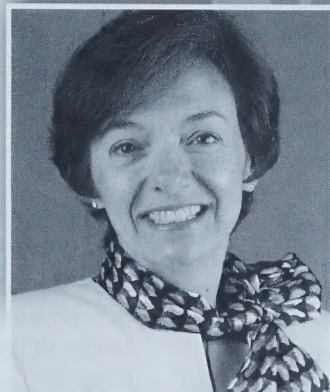
Historically, dental hygienists have had two primary concerns. One has been for the whole person, the person who either has oral disease or is at risk of having it. The other concern has been for the role of the environment and the individual in fostering or preventing oral disease. These concerns have led dental hygienists to view the client as participating in the care process, because it is ultimately the client who must use self-care to attain oral wellness. Consequently, dental hygienists focus on the client's culture, lifestyle, and behaviour patterns as they relate to oral health and disease.

These client-centred concerns suggested to us that human needs theory was the most appropriate theoretical framework for a conceptual model of dental hygiene. First, human needs theory reflects dental hygiene's characteris-

Interview with Professor

Michele Darby, BSDH, MS

by Dennis Jones



tic client-centred approach. Second, it recognizes the essential contribution of oral health to a person's quality of life. Many dental hygienists attend intuitively to the human needs of their

clients, so a conceptual model based on this theory can incorporate the approaches that effective practitioners and educators already use.

The model helps us understand the complex relationships among human need fulfillment, human behaviour, and dental hygiene. Human behaviour is organized in relation to unsatisfied needs, so the dental hygienist can use such needs in the client to guide him or her toward the best possible oral health.

Q: What aspect of the dental hygiene profession inspires you the most?

That's easy! Students inspire me the most. Students are the main reason I have pursued a career as an academic. It is an opportunity to work daily with the future of dental hygiene and perhaps to have some influence on the direction of the profession.

Q: Where do you see the profession of dental hygiene going in the next 5 to 10 years?

I see the profession expanding worldwide! We have an unfulfilled mission, which is to work with international faculty and students to improve the quality of dental hygiene education and the standards of practice around the globe. Given the link between oral and systemic health, we know that properly educated dental hygienists can help cut the morbidity and mortality rates in underserved and undeveloped parts of the world. In other words, dental hygienists can contribute to the economic development and stability of countries by helping to keep the workforce healthy. Our students and colleagues need to embrace this mission.

Q: What do you think will be the biggest challenge to dental hygiene practice in the next decade?

The challenges for the next 10 years will be the same challenges that have been with us for several decades:

- standardizing dental hygiene curricula, particularly at the entry level;

- attaining credentials for dental hygienists, such as BS degrees, that are commensurate with the number of college credits earned;
- getting dentistry to recognize that the dental hygiene profession is not interested in undermining dentistry's role, rather that we wish to enhance it and thereby promote public health;
- increasing the number of qualified dental hygiene faculty, researchers, and administrators, which also means that we need to increase the number of hygienists who have master's or doctoral degrees and who are competent to assume these roles;
- increasing flexibility in licensure and practice laws so that access to cost-effective dental hygiene care can expand beyond the private practice setting;
- obtaining societal sanction for our expertise, which goes hand in hand with achieving professional autonomy and direct reimbursement for our services, so that dental hygienists may deliver care to the homebound, to residents in nursing homes, to people in institutional settings, and even to workers in the workplace.

If the profession meets these challenges, it can help control the escalating cost of health care by focusing on oral disease prevention, non-surgical periodontal therapy, and health promotion. This would indirectly prevent problems that are now being linked to poor oral health, such as respiratory disease, the birth of pre-term babies of low birth weight, and heart disease.

Q: The second edition of *Dental Hygiene Theory and Practice*, the textbook you co-authored with dental hygiene scholar Margaret Walsh, is to be published in 2003. Will there be more models and theories for dental hygiene practice in that book?

There will be no new conceptual models or theories in the second edition of the book. However, we have simplified the human needs model so that it can be easily applied to practice. The 11 human needs related to oral health in the original model have been integrated into 8, and these transcend all ages, cultures, nationalities, and genders. This revision makes the model's application to practice more efficient without losing the client focus and the comprehensiveness of the original. It therefore enables the dental hygienist to ensure that care is client-centred, not task-oriented. It is very relevant to contemporary practice and many dental hygiene schools are educating their students in this model of client care.

Q: Will you collaborate on more projects with Margaret Walsh? Can you elaborate on what these might be?

Dr. Walsh and I are currently building a web site to augment the new edition of *Dental Hygiene Theory and Practice*. The site will have numerous resources. Among them will be a test bank of questions and answers for students to assess their professional knowledge, supplemental colour images of oral conditions, enrichment materials, links to the latest dental hygiene information, teaching tips for educators, and study tips for students.

Q: Are we entering a new professional paradigm in dental hygiene? If so, what do you think this will

look like? If not, then why do you think things will remain the same?

We are not now looking at a new dental hygiene paradigm. Instead, we are working to get the current paradigm adopted as the foundation of the dental hygiene discipline. It has already been adopted by the American Dental Hygienists' Association and the Canadian Dental Hygienists Association and includes the major concepts of client, environment, health/oral health, and dental hygiene actions. The paradigm is focused enough to guide the profession, yet broad enough to allow the development of a variety of practices that can serve diverse populations, even in settings that we have not yet conceived. Furthermore, dental hygiene actions can change as the evidence base of practice changes. The current paradigm should serve the profession well into 21st century.

Q: What should we be teaching future dental hygienists in baccalaureate programs that is not already being taught in three-year associate degree (diploma) programs?

Preparation for entry-level dental hygiene requires the ability to make evidence-based decisions and to see beyond the role of the clinician in private practice. To make such decisions, students need to be competent in research methods and to be skilled in oral and written communication. They also need to be well versed in the principles of community-based practice, which encompasses oral health promotion and the control of oral disease in both individuals and populations. They need to understand the importance of cost-effective, coordinated care that addresses the needs of culturally diverse groups, which may also be vulnerable and underserved. They must also know how to use electronic technology to manage and communicate information. The materials and equipment that we use are becoming more high-tech, and students need to be competent, visionary, and confident in their application.

I am also in favour of a general education component as part of the entry-level curriculum for dental hygienists. It is important that we possess the basic problem-solving abilities, the diverse perspectives, and the critical-thinking skills that a general education encourages.

Finally, we need faculty who can motivate students to pursue master's and doctoral degrees in dental hygiene. Too few of our hygienists see graduate degrees in their futures. This mindset must change, and the change needs to start within our entry-level programs. Schools must actively share information with their students about the postgraduate programs that are open to them and must encourage the brightest to enter these programs.

Q: Are interdisciplinary collaborations emerging for dental hygienists? Could you give some examples?

Here at Old Dominion University, research is an integral part of academic life for both undergraduate and graduate dental hygiene students. Reflecting this, in the year 2000 our School of Dental Hygiene officially inaugurated the first Dental Hygiene Research Center (DHRC) in the United States. There are numerous faculty and student projects going on in partnership with other disciplines

and universities, supported by both private and foundation funds. For example:

- *Effectiveness of a Sodium Bicarbonate Oral Composition on Gingivitis and Plaque Accumulations* was a project conducted in collaboration with private industry to evaluate the effectiveness on gingivitis and plaque of a new, over-the-counter chewable tablet.
- *An Evaluation of the Clinical Efficacy of a Dentinal Tubule Occluding Dentifrice for the Relief of Dentinal Hypersensitivity* was conducted in collaboration with a pharmaceutical company to evaluate a new toothpaste's effects on sensitive teeth.
- *Effect of Daily Oral Hygiene Care on Oropharyngeal Colonization of Subsequent Development of Nosocomial Pneumonia in Intubated Patients* is a hospital-based project developed in collaboration with the DHRC, the Christopher Newport University Department of Nursing, and the Old Dominion University's Department of Medical Laboratory Sciences. The purpose of the project is to determine whether differences exist between nosocomial pneumonia rates for intubated patients in critical care who receive twice daily oral hygiene care with 0.12 per cent chlorhexidine, and those who receive a standard nursing oral care protocol.
- *Sulphur By-Product: A Potential Indicator of Periodontal Disease Activity* is a project evaluating a new periodontal device that measures sulfide levels within the gingival sulcus as an indicator of anaerobic bacteria breakdown and disease activity.
- *Effects of Occupational Ultrasonic Noise Exposure on Hearing Deficits in Dental Hygienists* is designed to evaluate hearing loss in dental hygienists. It is conducted in collaboration with the DHRC and the Old Dominion University Department of Early Childhood, Speech Pathology and Special Education.
- *Effects of Doxycycline on Endometrial Bleeding and Periodontal Disease* will evaluate first the efficacy of doxycycline in bleeding and spotting in women using a progestin contraceptive and second, the effects of doxycycline on periodontal health. The project is a collaboration of the Clinical Research Center at Eastern Virginia Medical School, the University of Florida, a clinical site in Santo Domingo, and the Dental Hygiene Research Center at Old Dominion University.

Q: What new and interesting developments are appearing in dental hygienists' scope of practice?

Dental hygiene's scope of practice is being affected by the blending of two major issues: access to care and technology. For example, we may begin to see "teledentistry"—dental hygienists working in underserved or remote areas where they are connected to dentists via satellite television. When a dental diagnosis is necessary and a decision is beyond the scope of dental hygiene practice, the dentist can make the needed decisions and direct the hygienist in caring for the client. Telemedicine is already being practised in intensive care and critical care units where there is a shortage of specialist physicians, sometimes called intensivists. Using two-way television, nurses in other

locations can care for and monitor critical-care patients under an intensivist's direction.

The rapid expansion of knowledge from the Human Genome Project is also influencing oral health care. In dental hygiene, we already have genetic testing to determine genetic susceptibility to periodontal disease. I believe that genetics will ultimately become a core science in our curriculum and will also be the foundation for many therapies. Even the chemotherapeutics that we use will be selected on the basis of the client's genetic profile. I also think that lasers will become standard technology for cosmetic tooth bleaching, sealing pits and fissures to control dental caries, and performing non-surgical periodontal therapy.

Q: What do you think of the role of dental hygienists in managed care organizations? From your experience in the United States, is managed care good for the dental hygiene profession?

Managed care is somewhat of an enigma for me. It has raised the level of frustration for many dentists and that is not good for either dental hygienists or patients. On the other hand, it has increased the number of patients in most practices, and that means a higher demand for dental hygiene services. If a dental hygienist emphasizes oral disease prevention and health promotion to the practice's clients, I believe that he or she can manage the client population's oral health so that the practice prospers under a managed care system. This can take several years to achieve, but it can be done so that managed care is profitable in terms of both client health and the economics of the practice. Regardless of insurance coverage, clients must understand that not all services can be covered in full and that insurance programs should never dictate the type of care prescribed.

Q: What should dental hygienists do or think differently in the new millennium, compared with what they did or thought in the nineties?

I think that members of the dental hygiene profession must keep in mind that we are connected to a global community. Those of us in the United States, Canada, and Western Europe enjoy the highest level of education and practice, but we cannot remain complacent about what we have. We need to forge partnerships with institutions beyond our borders to share what we have learned—dental hygiene is still in its infancy in Jordan, Kuwait, Germany, and Central America, to mention just a few countries. These countries need our assistance in training faculty, developing competency-based curricula, and improving population-based interventions and outcomes. The International Federation of Dental Hygienists can play a key role in this effort. Also, the new *International Journal of Dental Hygiene*, which should launch early in 2003, will do much to foster the exchange of knowledge among dental hygienists worldwide.

We have BS and MS programs in dental hygiene, but now is the time to develop doctoral programs as well. The primary purpose of doctoral education in dental hygiene is to prepare individuals of superior ability for leadership in expanding the theoretical, scholarly, and scientific dimen-

sions of dental hygiene. Dental hygiene research must emphasize both individual and community-based interventions and outcomes. Doctoral education would prepare a cadre of individuals who could develop and test theories, generate new knowledge, and bring knowledge from other disciplines—all to improve quality of care. The evolution of dental hygiene education toward the doctoral level would provide leaders, researchers, and scholars who would strengthen dental hygiene's research and educational capabilities. It would create academic legitimacy for dental hygiene and would secure its full credibility as a valid discipline. The outcome would be the expansion of an organized body of knowledge that serves societies worldwide as the foundation of quality dental hygiene care.

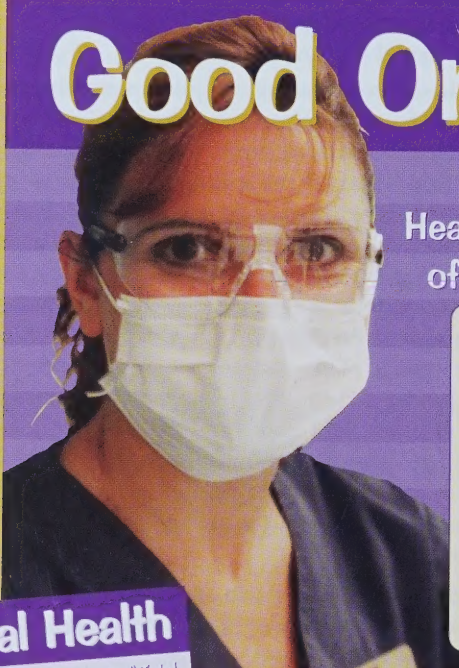
Q: Where do you find the time to balance all the interesting projects that you are involved in?

Balance is not my forte! I am a Type A workaholic and luckily require little sleep. Much of my best thinking takes place at 3 a.m. when everyone else in my household is asleep. I am fortunate to have been married for 30 years to another academic who understands the challenges of teaching, service, and research, and I could not have a better partner. Our daughter is now a freshman at Princeton University. Our son, who is a junior in high school, is still a major focus in our lives. I find great pleasure in our children's many achievements, be they academic, musical, crewing, or golf. They are very independent and yet are loving and supportive family members.

82

Good Oral Health

is an Important Part of Total Health and a Social Determinant of Health Across the Life-Span



THE CANADIAN DENTAL HYGIENISTS ASSOCIATION
L'ASSOCIATION DES HYGIENISTES DENTAIRES

CONSEQUENCES OF POOR ORAL HEALTH

- Physical**
- Food intake restricted
 - Oral disorders are common
 - Handicapping outcomes
 - Heart attacks are more common
 - Inflammation (e.g., gum disease)
 - Recurrent infections
 - Increased risk for

- Social, Psychological**
- Conversation, smiling
 - Oral disorders and
 - Many work loss
 - Lower morale and

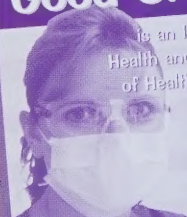
PUBLIC NEED

Access to regulated
Informed consent
Ownership of personal health info
Affordable prevention

1. Under Dental: The importance of oral health in the prevention of disease.
2. Oral: 200-170
3. Inflammation: 200-170
4. Oral: 200-170
5. Oral: 200-170
6. Oral: 200-170
7. Oral: 200-170
8. Oral: 200-170

Good Oral Health

is an Important Part of Total Health and a Social Determinant of Health Across the Life-Span



THE CANADIAN DENTAL HYGIENISTS ASSOCIATION
L'ASSOCIATION DES HYGIENISTES DENTAIRES

INFORMATION AND COORDINATION

by a registered dental hygienist (RDH)
The RDH as part of the interdisciplinary healthcare team:

- Provides ongoing staff training
- Problem solves oral hygiene issues with team members
- Provides/coordinates ultrasonic cleaning and denture marking service
- Recommends oral hygiene products

The RDH as liaison and professional care provider:

- Liaises with and provides referrals to physicians, dentists, denturists and others as needed and coordinates follow-up
- Advocates for the client

The RDH caring for client and family support persons:

- Documents client's medical history and assesses oral conditions
- Based on the dental hygiene diagnosis, informs and consults with client, develops and implements individual oral hygiene care plan
- Provides treatment within full scope of practice including scaling and other preventive therapy
- Provides ongoing evaluation
- Consults with/educates client and family regarding oral health needs

CONSEQUENCES OF POOR ORAL HEALTH

- Physical**
- Food intake restricted
 - Oral disorders are common
 - Handicapping outcomes
 - Heart attacks are more common
 - Inflammation (e.g., gum disease)
 - Recurrent infections
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- Social, Psychological and Economic**
- Conversation, smiling
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7. Oral: 200-170
8. Oral: 200-170

Social Determinants of Health across the Life-Span: A Poster Presentation

Pat Spencer presented a poster, on behalf of the Canadian Dental Hygienists Association, at the Social Determinants of Health Across the Life-Span Conference that was held late last year in Toronto. From November 29, 2002, to December 1, 2002, over 400 Canadian social and health policy experts, community representatives, and health researchers met at York University in Toronto.

Ten social determinants of health—early life, education, employment and working conditions, food security, health services, housing, income and income distribution, social exclusion, social safety net, and unemployment and job insecurity were chosen by the conference organizers on the basis of the determinants' prominence in policy statements and documents of Health Canada and the World Health Organization. These determinants are also consistent with public understanding of the factors supporting health and well-being and are aligned with governmental structure, academic disciplines, and public policy frameworks. These areas have also been the focus of recent governmental activity at the federal, provincial, and municipal levels.

The Canadian Dental Hygienists Association wishes to thank Pat Spencer for her participation in this conference and her poster presentation that created an important link between dental hygienists and other multi-disciplinary health professionals. This type of relationship building is an important step in having oral health recognized as an important part of general health.

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- **Better beyond the bristles** — Sonicare Elite is clinically proven *in vitro* to disrupt three times more plaque biofilm beyond the bristles than the leading brand²
- **Even gentler** — Sonicare Elite is four times gentler on dentin than the leading brand³
- **Most preferred** — Sonicare Elite is preferred over Braun Oral-B 3D Excel among US dental professionals⁴

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PHILIPS
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1. Platt K, Moritis K, Johnson MR, Berg J, Dunn JR. Philips Oral Healthcare. *Am J Dent* 2002;15(Special Issue):18B-22B. (versus Sonicare Advance)

2. Hope CK, Wilson M. University College London, Eastman Dental Institute. *Am J Dent* 2002;15(Special Issue):7B-11B. (in vitro study versus Braun Oral-B 3D)

3. Sorensen JA, Nguyen H. Oregon Health and Science University. *Am J Dent* 2002;15(Special Issue):26B-32B. (in vitro study versus Braun Oral-B 3D Excel)

4. 2002 U.S. Survey data

l'intercession, est appréciée des employeurs, de la collectivité et des hygiénistes elles-mêmes. Les hygiénistes dentaires sont capables de mettre à profit l'ampleur de leur éducation et de leur formation dans leurs activités quotidiennes et cette capacité mène à un plus grand degré de satisfaction professionnelle et à une amélioration de la qualité de vie pour nos collectivités.

J'ai rêvé d'un monde où des milieux de pratique alternatifs basés sur la référence, ou spécialisés, aident à améliorer le recrutement et la rétention au sein de la profession. Nos étudiants et étudiantes veulent explorer toutes les possibilités que leurs études peuvent leur offrir. Nos jeunes choisissent des carrières qui leur offrent des options pour leur vie de travail future. Deux articles publiés dans le numéro de Septembre/octobre 2002 de *Probe*, "Alternate Practice" de Melinda Ferguson et "Entrepreneurship" de Pat Spencer, méritent d'être lus et relus pour nous rappeler à quel point notre contribution à l'amélioration de la qualité de vie des Canadiennes et des Canadiens peut être précieuse.

J'ai rêvé d'un monde où les gouvernements et les entreprises soutiennent la santé buccale préventive, en créant une atmosphère où la recherche et l'enseignement sont améliorés et où la disponibilité de l'éducation permanente est accrue. Comme le dit Roy Romanow : "Il est plus logique d'essayer de maintenir les gens en bonne santé que de les traiter lorsqu'ils sont malades. Il est donc tout aussi logique que notre système de santé mette davantage l'accent sur la prévention de la maladie et sur la promotion de modes de vie sains. C'est la meilleure façon d'assurer la viabilité de notre système de santé à long terme.... Mais il faut plus que de beaux discours, des gestes concrets doivent être posés. Je recommande donc que l'on mette davantage l'accent sur la prévention et le mieux-être dans le cadre d'une stratégie globale visant à améliorer la prestation des soins de santé primaires au Canada, qu'on affecte de nouveaux crédits à la recherche sur les déterminants de la santé et que les gouvernements s'engagent à mettre en place les mesures qui sont nécessaires pour faire des Canadiens le peuple le plus en santé au monde."¹

Le commissaire Romanow est même allé plus loin en recommandant que "le Conseil de la santé du Canada devrait examiner les programmes d'études et de formation existants et faire des recommandations aux provinces et territoires de façon à ce que les programmes d'études soient davantage intégrés pour mieux préparer les professionnels de la santé, en particulier pour le travail en milieu de soins de santé primaires."² Espérons que nos gouvernements s'emparent de la rondelle à ce sujet et que ce geste incite les entreprises à faire de même.

**J'ai rêvé d'un monde
où les hygiénistes
dentaires de tous les
coins du Canada
pratiquent dans un
cadre de collaboration
avec le domaine des
soins de santé et sont
des membres
respecté(e)s de
l'équipe, qui prennent
des décisions fondées
sur la preuve.**

J'ai rêvé d'un monde où les hygiénistes dentaires sont actives et actifs au niveau politique et travaillent pour un système de soins de santé buccale plus équitable. Notre "système" actuel est truffé de problèmes, dont l'un est l'accès aux services dans les milieux ruraux et éloignés. Dans son rapport Romanow recommande au gouvernement du Canada de créer un Fonds d'accès des collectivités rurales et éloignées qui servirait en partie "pour soutenir des moyens novateurs d'assurer des services de santé aux petites collectivités et d'améliorer l'état de santé de leurs habitants."³ Je peux voir

les hygiénistes dentaires comme étant les pourvoyeurs de soins de santé idéaux pour utiliser un tel fonds.

En chemin, nous avons souffert de nombreuses difficultés, rencontré des barrages, et reçu des balafres, alors que notre profession travaillait à réaliser son rêve. J'entends une citation : "Prends une cicatrice et fais-en une étoile." Mes amies et amis, certains choses méritent bien qu'on se battent pour elles, et, dans une bataille, la plupart des soldats reçoivent au moins une cicatrice qui leur rappellera le combat soutenu. En pensant aux changements qui se produisent tout autour de nous, je me rappelle de Martin Luther King Jr., lorsqu'il a dit : "Mes amis, aujourd'hui je vous dis que, même si nous avions à affronter les difficultés d'aujourd'hui et de demain, mon rêve rest intact."⁴

On peut joindre Karen Wolf au <president@cdha.ca>. 

1. Commission sur l'avenir des soins de santé au Canada : Guidé par nos valeurs : L'avenir des soins de santé au Canada [Rapport Romanow]. Ottawa : Imprimeur de la reine, 2002, p. 21
2. Ibid, p. 143
3. Ibid, p. 203
4. King, Martin Luther, Jr. : discours prononcé lors de la marche sur Washington pour l'emploi et la liberté, le 28 août 1963, Washington, D.C.

"THE EVOLUTION OF THE DENTAL HYGIENIST"

(continued from page 58)

teeth." This hygienist will know the role of anti-infective treatment, risk modification, and when to refer a patient for regenerative therapy. This hygienist will be able to improve the systemic health of the patient to a significant degree. In my opinion, we must also strive to preserve and improve our relationships with the periodontal specialist and not isolate ourselves from working with the dental profession if we want to provide the best treatment available for our clients. The future of dental hygiene is wonderfully bright. 

"BACCALAUREATE AS ENTRY TO PRACTICE"

(continued from page 57)

rather than an option. Dental hygienists need prospects for vertical growth and upward mobility if they are to stay motivated and interested in their chosen profession.

Social, economic, political, and technological forces will influence future dental hygiene practice. Dental hygiene education in Canada must respond to these changes by promoting and incorporating future developments in educational strategies, theory development, and research. We must be proactive and prepare graduates for increasing levels of responsibility and accountability in new and varied practice environments.

Does making the baccalaureate degree an entry-to-practice standard indicate that CDHA is pushing for self-employment or independent practice? No. CDHA believes that dental hygienists, as prevention professionals, should be able to choose their own work environment from a multiplicity of practice environments. There is much evidence to suggest that we do not have an optimal oral health delivery system. The public has evolving oral health needs and expectations,

central to which are the key elements of accessibility, choice of provider, cost, and accountability.

In January members were consulted—via the Members Only section of our web site—about their thoughts regarding the draft paper *Access Angst: A CDHA Position Paper on Access to Oral Health Services*. The paper was revised following member input and will be reviewed by the Board of Directors at its March meeting. Look for further updates on the web site and in coming issues of *Probe*. The access issues in this paper add further support to the need for baccalaureate-prepared entry-level dental hygienists.

Does this make practising dental hygienists less qualified? No, your work experience and continuing education efforts will enhance your career profile. As the profession continues to evolve through self-regulation and alternative practice settings, more employment opportunities will continue to present themselves.

In closing, I would like to congratulate the College of Dental Hygienists of British Columbia for demonstrating its leadership.

"LE BACCALAURÉAT COMME SEUIL D'ENTRÉE À LA PRATIQUE"

(suite de la page 57)

dentaire comme la profession qu'elle est. Comme l'hygiène dentaire a cru et a évolué au cours de cinq décennies, guidée par l'explosion de nouvelles connaissances, des changements démographiques et des nouvelles technologies, le besoin de ménager des occasions de faire des études avancées est devenu une nécessité plutôt qu'une option. Les hygiénistes dentaires ont besoin de perspectives de croissance verticale et de mobilité vers le haut pour rester motivées et intéressées vis-à-vis la profession qu'elles ont choisie.

Les forces sociales, économiques, politiques et technologiques influenceront la pratique future de l'hygiène dentaire. L'enseignement de l'hygiène dentaire au Canada doit répondre à ces changements en faisant la promotion des développements futurs et en intégrant ceux-ci aux stratégies d'enseignement, au développement des théories et à la recherche. Nous devons être proactifs et préparer les diplômés à des niveaux accrus de responsabilité et de reddition de comptes dans des milieux de pratique nouveaux et variés.

Est-ce que le fait de faire du baccalauréat une norme d'entrée à la pratique indique que l'ACHD milite en faveur de l'emploi autonome ou de la pratique indépendante ? Non. L'ACHD croit que les hygiénistes dentaires, en tant professionnels et professionnelles de la prévention, devraient avoir la faculté de choisir leur propre milieu de travail à partir d'une multitude de milieux de pratique. Il y a une multitude de preuves

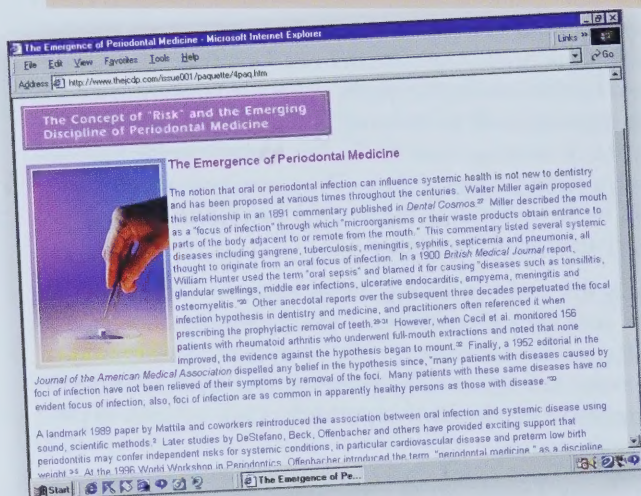
pour suggérer que nous n'avons pas un système optimal de prestation des soins de santé buccale. Les besoins et des attentes du public en matière de santé buccale sont en changement, et, au cœur de ces besoins, se trouvent les éléments d'accessibilité, de choix du pourvoyeur, du coût et d'obligation d'assumer des responsabilités.

En janvier, nous avons consulté nos membres, par le truchement de la section réservée aux membres de notre site web, pour connaître leur opinion sur l'ébauche de document intitulé *Access Angst: A CDHA Position Paper on Access to Oral Health Services*. Le document a été révisé suite aux commentaires reçus des membres et sera examiné par le conseil d'administration à sa réunion de mars. Surveillez les autres mises à jour sur le site web et dans les prochains numéros de *Probe*. Les questions d'accès dont traite ce document viennent ajouter un appui supplémentaire au besoin d'hygiénistes dentaires qui auront préparé leur entrée à la profession au niveau du baccalauréat.

Cette évolution rend-elle les hygiénistes dentaires déjà en pratique moins qualifiées ? Non, votre expérience de travail et les efforts que vous avez consacrés à l'éducation permanente amélioreront votre profil de carrière. À mesure que la profession continue à évoluer grâce à l'auto-réglementation et aux milieux de pratique alternatifs, un plus grand nombre d'occasions d'emploi continueront à se présenter.

En terminant, j'aimerais féliciter l'Ordre des hygiénistes dentaires de la Colombie-Britannique pour le leadership dont il a fait preuve.

**Il s'agit là d'un pas
de géant dans le sens
de l'objectif à long
terme de l'ACHD,
soit celui de faire
reconnaître l'hygiène
dentaire comme la
profession qu'elle est.**



by Karen Wolf, DipDH

Loveliest of trees, the cherry now
Is hung with bloom along the bough,
And stands about the woodland ride
Wearing white for Eastertide.

— A Shropshire Lad, by A.E. Housman

Spring has arrived or is at least on its way and it is a great time to develop our professional portfolio by taking some time to continue our education.

Journal of Contemporary Dental Practice (www.thejcdp.com/issue001/paquette/4paq.htm)

Believe it or not, the concept that there is a link between oral infection and systemic health has been proposed at different times throughout the centuries with articles being published on the topic as far back as the late 1800s. The October 1999 issue of this journal has as its feature article, "The Concept of Risk and the Emerging Discipline of Periodontal Medicine." An excerpt: "At the 1996 World Workshop in Periodontics, Offenbacher introduced the term, 'periodontal medicine,' as a discipline that focuses on validating this disease relationship and its biological plausibility in human populations and animal models. As more studies, including randomized clinical trials, are conducted over the next decade, periodontal medicine may ultimately guide clinicians in making evidence-based decisions to improve not only patient oral health but also systemic health as well."¹ You will discover a host of information at this site—on periodontal medicine and preterm low birth weight, and periodontal medicine and cardiovascular disease. It has great references.

1. Paquette, D.W., Offenbacher, S.: The concept of risk and the emerging discipline of periodontal medicine. *J Contemp Dent Pract* 1(1): pp. 1–8, 1999
2. Klokkevold, P.R.: Periodontal medicine: assessment of risk factors for disease. *J Calif Dent Assoc* 27(2): pp. 135–142, 1999

Journal of the California Dental Association (www.cda.org/member/pubs/journal/jour299/risk.html)

On this same topic, Perry R. Klokkevold, DDS, MS, published "Periodontal medicine: assessment of risk factors for disease," a well-referenced article in the 1999 *Journal of the California Dental Association*.²

"The approach to the diagnosis and treatment of periodontal disease is changing. The disease has not changed, but dentistry's understanding of the pathogenesis and appreciation for the influence of host factors has improved. As a result, the approach to the management of the disease is evolving. This paper reviews some of the host risk factors that have been linked to an increased severity of periodontal disease and briefly highlights some of the evidence that has led to the current belief that periodontal disease may be a risk factor for adverse systemic health conditions." He goes on to talk about the local risk factors for periodontal disease, citing both a simplistic and a more complex model for disease activity.

Among the systemic "host" risk factors he discusses are diabetes mellitus, smoking and tobacco, psychosocial stress, and genetic predisposition. As food for thought, I leave you with the following view on the periodontal examination:

Traditionally, the complete periodontal examination consisted of evaluating and documenting several findings (signs and symptoms of disease). It typically includes an evaluation and charting of probing pocket depth, attachment loss, gingival margins, inflammation, bleeding on probing, sulcular exudate, missing teeth, contacts, and occlusion.

...

This method of examination and documentation remains an important part of identification, prevention, and treatment of patients with periodontitis. However, the problem with this method of diagnosing periodontal disease is that it is limited to detecting disease after it has occurred, and it assumes that all individuals are equally susceptible. It does not have any predictive value nor does it take into consideration differences among individual patients (i.e., host factors). To identify the patients early (ideally prior to the onset of severe periodontitis), practitioners must place an emphasis on determining risk factors for each individual via better medical history (diabetes), family history (genetic predisposition), and social history (smoking), as well as an evaluation of other environmental factors (stress).²

Check out this article – a very worthwhile read.

Until next time... 

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Another
Success:

The 2002

Oral-B®

Health

Awards

90



National Dental Hygienists Week
La semaine nationale des hygiénistes dentaires



Marie Lochhead, Fort Erie, Ontario

From local mini-clinics to oral health care for teddy bears, Canadian dental hygienists again rolled out their best efforts to celebrate National Dental Hygienists Week.

As part of these celebrations, the Canadian Dental Hygienists Association (CDHA) and Oral-B Laboratories together sponsored the Oral-B Health Promotion Awards to encourage hygienists to promote oral health in their communities. Individual contest winners received a cash prize of \$1,000 while school and clinic winners got \$2,000 each. All prizes were split between the winners and their local societies, with Oral-B providing the prize money and the health promotion kits that the hygienists distributed to their clients or the public.

"I never cease to be amazed at the ingenuity and creativity of our members," says Susan Ziebarth, CDHA Executive Director. "They're so committed to what they do that the entries just get better every year."

A mere glance at those entries shows that the people behind them don't limit their enthusiasm to National Dental Hygienists Week. Nearly everybody writes about all the other things they've done to improve Canadians' oral health during the rest of the year. "And that becomes a very long list, indeed," adds Susan Ziebarth. "They're so dedicated they just won't stop."

And now, here are the winners of this year's Oral-B Health Promotion Awards, by category.

Best Effort, Individual

Winner: Marie Lochhead, Fort Erie, Ontario

The town of Fort Erie lies in the wine country of Ontario's Niagara Peninsula, right across the Niagara River from Buffalo. The Peace Bridge crosses the river here, making the town a major gateway between Canada and the United States.

With a population of just over 28,000, Fort Erie isn't a big town, but its people have big hearts. Nothing showed this more clearly this past year than the efforts of Marie Lochhead to bring dental health awareness to people who, because of straitened circumstances, may well have needed it most.

The main focus of her Oral-B Health Promotion Awards project was to meet the needs of underserved groups in the Fort Erie community. Enlisting the help of colleague Dawn Romard, Marie decided the best place to do this was the St. Michael's Soup Kitchen, where local families and individuals can come once a month for a hot meal and a bag of groceries.

The centrepiece of the project's "mini-clinic" was a display board to draw people's interest and help engage them in conversation with Marie and Dawn. Bright with red and blue fabric and paint, one side of the display described the programs the clinic offered, while the other had graphics of children's and adults' toothbrushes. On the display table were models to show brushing and flossing methods, the Oral-B flip chart, and wicker baskets full of dental care samples. An activity book about nutrition, oral health care, and the role of dental hygienists rounded out the presentation.

At the first session, "Your Health—Your Mouth," Marie took pains to create a relaxed atmosphere, chatting with people to find out their needs and their levels of understanding. The response was, in her words, "Fantastic. At our first session we talked to 150 people and supplied them with oral health care supplies and information."

The mini-clinic helped adults choose the brushes most suited to their needs and discussed the best amount and type of toothpaste to use. For families, Marie explained to parents which toothbrushes were right for their children. Along with this advice and the distribution of free samples, she used the dental models and the Oral-B flip chart to help people understand the best ways to achieve oral health.

Perhaps the best part of the session was the excitement of the children and the interest shown by the grown-ups. "Many people asked us questions regarding their own personal care," says Marie. "And we were approached by two people asking for similar help in other communities."

After that, what do you do for an encore? Simple—you keep going. Marie intends to. She's already planned three more sessions for 2003!

"I never cease to be amazed at the ingenuity and creativity of our members"



Huron-Grey-Bruce Dental Hygienists' Society

91

Best Effort, Clinic or Society

Winner: Huron-Grey-Bruce Dental Hygienists' Society

The Huron-Grey-Bruce Dental Hygienists' Society must be one of the busiest in all Ontario. From Wiarton in the north to Gorrie in the south, across 330 square kilometres of town and country, there's never a dull moment for its 50 members—especially during National Dental Hygienists Week (NDHW).

"A great deal of planning and the work of many dedicated volunteers went into our celebration of NDHW," says Mary Dawson, co-chair of the activities. "In fact, we had so many events planned that they wouldn't all fit into one week."

That's crystal clear from the spate of activities that reached into every corner of the hygienists' huge territory. As the centrepiece of their contribution to NDHW, they teamed up with the Owen Sound-Saugeen Junior "B" Hockey Club—the Greys—to promote dental hygiene and the importance of using mouth guards in sports. On the night of the Greys' game with Listowel, they set up a big oral health display at the arena, along with a toothbrush exchange and a toothbrush toss.

It was a great evening. Sponsors helped out with samples and prizes, and hygienist Doris Waite sang the national anthem. The society's new mascot, a big white molar with a winning smile, dropped the puck in its public debut, and Sandy Rackley did a great job in the announcer's booth, providing oral health tips during the game. (She did so well they've asked her to come back and do it again!)

But there was lots more than hockey. To pay special attention to the oral health of children, four area elementary schools held a colouring contest and a lucky winner from each school won an electric toothbrush. Hygienists visited

The 2002 **Oral-B** Health Promotion Awards



University of Alberta's Dental Hygiene Program

"They're so committed to what they do that the entries just get better every year."

elementary schools in Markdale and the Kincardine area, teaching children about tooth brushing, good snacks, bad snacks, and going to the dentist. And during Junior Kindergarten registration, hygienists set up information tables at several schools to answer parents' and students' questions about oral health.

These busy hygienists haven't neglected sports enthusiasts, older citizens, or the general public, either. They held a clinic at which they took impressions for 150 sports mouth guards. They treated the residents of Durham's Rockwood Terrace to a denture inspection and cleaning and, to help with the public education side of NDHW, they enlisted the support of local newspapers to print dental hygiene tips.

After all this work to improve oral health in its far-flung community, it's no wonder the Huron-Grey-Bruce Dental Hygienists' Society took first prize in its class!

Best Effort, School

Winner: University of Alberta's Dental Hygiene Program

Faculty and students of the University of Alberta's Dental Hygiene Program don't miss a trick—they enlisted the support of Edmonton's mayor to officially proclaim National Dental Hygienists Week and thus get it off to a roaring start.

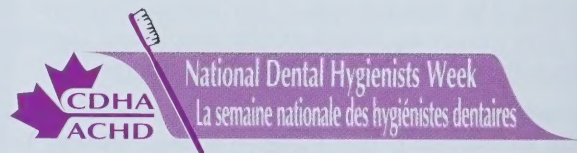
"Visits to your dental hygienist contribute to a lifetime of talking, eating and smiling," the proclamation said, and the part about "lifetime" came true almost immediately—40 minutes into NDHW, the first baby of the week was born. Dental hygiene students and a faculty representative presented the newcomer with soothers, teething rings, sleepers, bibs, socks, and a Winnie-the-Pooh bear.

After that lightning takeoff, the pace never slowed. Dental hygiene students were up early the next day, promoting NDHW activities on A-Channel's "Big Breakfast Show" by using a portable dental chair to assess the oral health of the show's host (who got his on-air makeup somewhat smudged in the process). They capped the segment by telling the audience about the University of Alberta's dental hygiene clinic and the role of hygienists in oral health care.

Elsewhere, flying NDHW banners they designed themselves, faculty and students set up information booths in the Students' Union Building and the Cross Cancer Institute. At the Students' Union, they distributed toothbrushes, sugar-free treats, mouth mirrors, and pamphlets on oral

hygiene. To add more excitement, they held draws for electric toothbrushes, beach towels, directors' chairs, and a free dental hygiene appointment.

Over at the Cross Cancer Institute, the dental hygiene booth received an overwhelming response from both patients and hospital staff. The students talked with them about oral health, nutritional needs, and especially about the severe oral implications of cancer therapies. They also distributed dental hygiene aids, sold powered toothbrushes at cost, and held a draw for a free one. The greatest success of the project was to make people in cancer therapy much more aware of the important oral health support that dental hygienists can give them.



Just describing their NDHW activities, though, doesn't begin to describe how deeply these students and faculty are involved in their community during the rest of the year. They participate in the Canadian Imperial Bank of Commerce's "Run For the Cure" to raise funds for breast cancer research. They spend a full day every year in providing free dental hygiene services for people without dental insurance or social assistance coverage. And as if all this weren't enough, they promote oral health to high-needs children, to people in ESL programs, and to adults and children who are developmentally delayed.

For their enthusiastic and effective work in improving oral health and oral health education in their community, the faculty and students of the University of Alberta's

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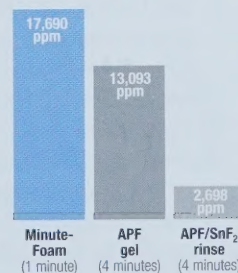
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Wind Suits and Mouth Guards: When the clinic staff at the Dental Centre in Wynyard, Saskatchewan, are out promoting oral health, they all wear matching wind suits provided by Veronica Hermiston (you may remember that Veronica won the Oral-B Health Promotion Award for Individual Best Effort last year). During NDHW, she and her colleagues worked for free to make mouth guards for sports participants. People came long distances for the guards and the children especially enjoyed having a choice of colours.

Way Down South: Monika Brenne of Streetsville, Ontario, spent five days in Guatemala working as a volunteer in the remote town of Monterrico. Supported by Health Outreach International, Monika and three other volunteers worked in a makeshift clinic to bring dental care to a community where some children have never seen a toothbrush. She found the trip so rewarding that she hopes to participate again in 2003.

On the Road in Regina: For her Oral-B Health Promotion Awards project, Marcia Crawford whizzed around Regina all week, starting out by doing a radio interview to educate listeners about oral health care. Next she was off to set up a display in a mall, where she gave out toothbrushes and floss and answered questions about dental hygiene. Then it was a visit to a local nursing home for demonstrations on denture care followed by a session at a prenatal clinic where she handed out baby kits to expectant parents (and became known as the "Tooth Fairy" into the bargain).

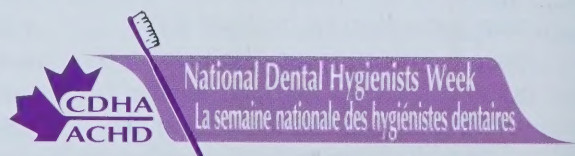
We Love a Parade: In Salmon Arm, British Columbia, Jackie Bannister, her colleagues and eight children entered the fall

fair and parade. They dressed as hygienists and tooth fairies and even had a tooth costume, while the children decorated a cart with drawings of smiles, healthy teeth, and unhealthy teeth. Just as they deserved, they won a ribbon for first prize and an Honourable Mention in the Oral-B Health Promotion Awards.

Bear With Us: In St. John's, Newfoundland, the Janeway Children's Hospital Foundation puts on a Teddy Bear BASH (Bear Ambulatory Surgical Hospital) every year. This year, Anne Clift of the Janeway Dental Department set up a Tooth Booth that included a fully operational dental operator. More than 1,000 children got to sit their teddies in the dental chair for an oral health assessment, bear style. In return for good behaviour, the teddies received a "smiley tooth" sticker and the children got toothbrushes.

NDHW was an incredibly busy—and rewarding—time for hygienists and patients alike. In fact, each year seems to result in more Oral-B Health Promotion Awards activities that include even more of our members. What could they possibly do next year that tops what they've already done? As you know, they are a creative bunch. We're sure they'll come up with something!

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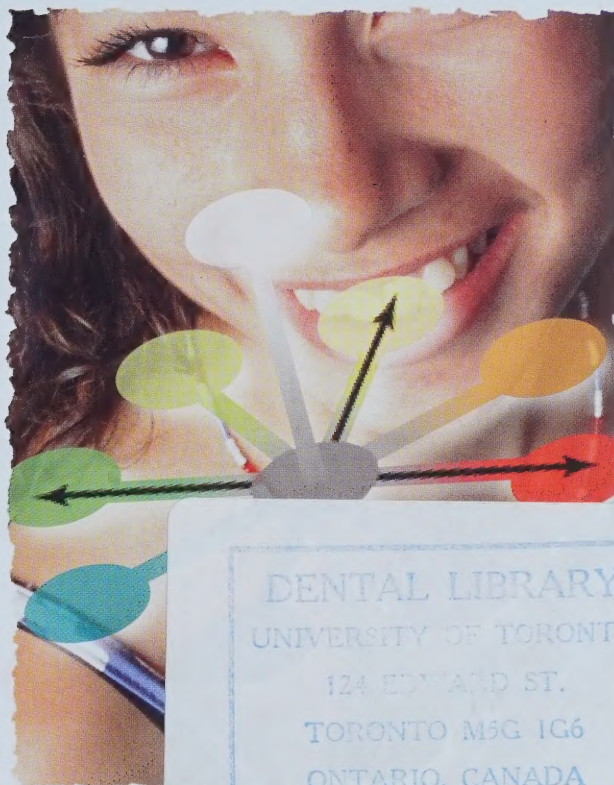
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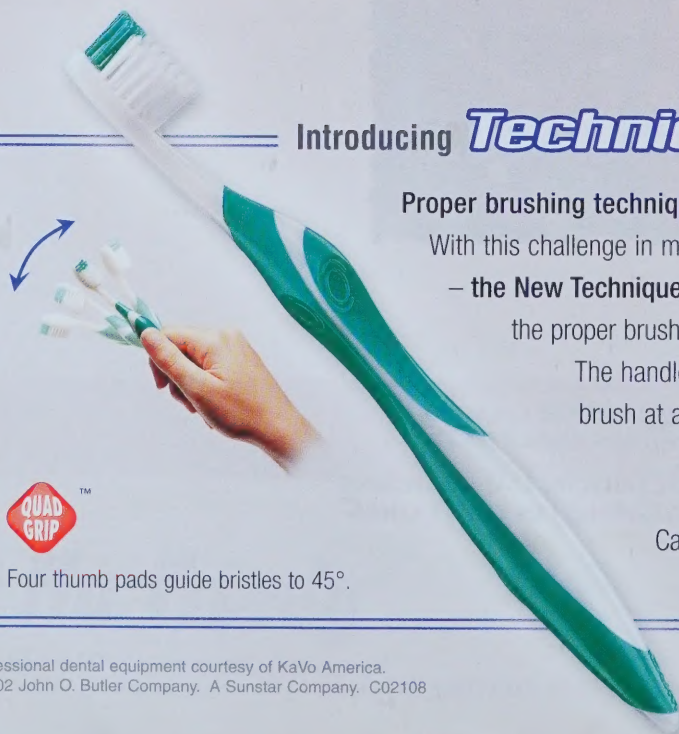
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A BRAVE NEW WORLD

BY KAREN WOLF, DipDH

New conditions can be significant in producing new men and women, and new men and women can help to create new conditions.

– Charles Ringma

In March 2003, the CDHA Board of Directors approved the well-referenced document, *Access Angst: A CDHA Position Paper on Access to Oral Health Services*. This paper discusses the barriers to accessing oral health services here in Canada and makes recommendations for improving our present oral health services environment. A paper may be able to help solve this national issue but cannot do it alone. As a national association, CDHA is working toward the goal of reducing the barriers surrounding access to preventive oral health services from coast to coast. As individual professionals, dental hygienists practise responsibly and strive for excellence as they deliver preventive oral health care to Canadians on a day-to-day basis. To create a brave new world requires teamwork.

I challenge each of you to read the Access Angst paper on-line in the Members Only section of our web site (www.cdha.ca).

In my last President's Message ("I Have a Dream"), I talked about the changing world and about the battle scars associated with our efforts to change our world. I also spoke about never giving up on the dream, never giving up the fight to create new conditions. Our society is one in which complacency is labelled the status quo. Those working to create a better society are called troublemakers, troublemakers who are then later given accolades for their great accomplishments. Society is fickle. What more can I say?

Striving for excellence is a journey filled with amazing people—people to whom we are accountable for the outcomes, people with whom we pursue this quest. Losing sight of those to whom we are accountable will cause us (either the national association or the individual dental hygienist) to lose sight of our objective. It may even lead us to focus only on our own personal agendas. Agendas are momentary things but the oral health and total wellness of Canadians will be a concern for generations to come. Helping to create new conditions to

LE MEILLEUR DES MONDES

PAR KAREN WOLF, DipDH



De nouvelles conditions peuvent compter beaucoup dans la production de nouveaux hommes et de nouvelles femmes; et les nouveaux hommes et les nouvelles femmes peuvent contribuer à la création de nouvelles conditions.

– Charles Ringma

En mars 2003, le conseil d'administration de l'ACHD a approuvé le document riche en références intitulé *Access Angst: A CDHA Position Paper on Access to Oral Health Services* (*L'anxiété concernant l'accès : un énoncé de position de l'ACHD sur l'accès aux services de santé buccale*). Ce document traite des obstacles à l'accès aux services de santé buccale, ici même au Canada; et il fait des recommandations en vue de l'amélioration de notre environnement actuel de services de santé buccale. Un document peut aider à résoudre cette problématique nationale, mais ne peut le faire seul. Comme association nationale, l'ACHD œuvre dans le but de réduire les barrières à l'accès aux services préventifs de santé buccale d'un bout à l'autre du pays. En tant que professionnels travaillant seuls, les hygiénistes dentaires sont responsables dans leur pratique et s'efforcent de tendre à l'excellence en dispensant des soins préventifs de santé buccale à leurs concitoyens sur une base quotidienne. Pour créer le meilleur des mondes, il faut recourir au travail d'équipe.

Dans mon dernier message, (« J'ai rêvé d'un monde »), je parlais du monde en évolution et des cicatrices laissées par les combats associés à nos efforts pour changer notre monde. J'ai également affirmé qu'il ne fallait jamais abandonner la partie en ce qui concerne le rêve, de ne jamais abandonner la lutte pour créer de nouvelles conditions. Notre société en est une dans laquelle la complaisance est qualifiée de statut quo. Ceux et celles qui travaillent à créer une meilleure société sont appelés des fauteurs de troubles à qui on donne par la suite des accolades pour leurs grandes réalisations. La société est inconstante. Que puis-je ajouter ?

La poursuite de l'excellence est un cheminement rempli de personnes étonnantes ; des personnes auxquelles nous sommes redevables des résultats atteints, des personnes avec lesquelles nous poursuivons cette quête. Si nous oublions ceux à qui nous devons rendre des comptes, nous perdrons de vue notre objectif (comme l'association nationale ou comme hygiéniste dentaire). Ce qui peut même nous amener à nous concentrer exclusivement sur nos programmes personnels. Ceux-ci sont l'affaire du moment-même, mais la santé buccale et le bien-être total des Canadiens resteront une préoccupation pour des générations à venir. Aider à créer de

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"LE MEILLEUR DES MONDES" ... suite à la page 127



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WAR AND SCIENTIFIC ADVANCES

BY CAROL BARR OVERHOLT, RDH, BEd



When the war in Vietnam was drawing to a close, I was trying to assimilate into the high school world. Consumed with sports, Pink Floyd, and my own personal war against acne, I had little interest in what was someone else's fight in a faraway place. Even the Kent State shootings failed to rouse me from indifference.

By the time the Gulf War came around, I was teaching, taking philosophy classes at night, and considering how much pain might really be involved in labour and delivery. Although I thought about the safety of both soldier and civilian, I felt no personal connection to the conflict and actually recall very little about it now. However, when the war against Iraq was imminent this year, I felt an extraordinary link to the nationwide concerns for the welfare of the global environment. I understood the worries of the American government, but like many Canadians felt confused. I found myself reading articles written by military analysts and global thinkers; scouring Op-Ed pages of national newspapers for opinion essays on the various aspects of war; on Sunday mornings, watching back-to-back American political shows where war historians, journalists, futurists, and politicians hashed out the upshot of an international conflict.

*"Medicine in general has
advanced monumentally
during wartime."*

I didn't realize I was being observed acutely until my husband quietly asked me one morning what I was hoping to discover by soaking in everything the media was generating. Evidently I had a feverish look on my face when watching the nightly coverage of network war correspondents. What *was* I looking for? I let the question ferment for a couple of days and then the answer surfaced: I was searching for evidence that something good might emerge from such strife. Otherwise, how could it make any sense?

Every year in my orthodontics course, I screen a program produced by *Nova* entitled, "The Normal Face." The show details the disfiguring craniofacial defects of Crouzon and Treacher Collins syndromes and their surgical repair. When I ask the students what particularly impresses them about the program, the answers encompass awe for the complex surgeries, the ability and compassion of the surgeons, and the strength of character of those suffering from the disorders. This year, however, one answer stood out—one that could only have

been given in the midst of a well-televised war: modern craniofacial surgery was pioneered during the Vietnam and World Wars; indeed, medicine in general has advanced monumentally during wartime.

The War of 1812 saw Apothecary General Francis LeBaron designate a smallpox vaccinating team to journey out and immunize the Northern Army. Using the war as an opportunity to study the scientific effectiveness of

mass immunization, he confirmed that vaccinating a vulnerable population was an effective means of controlling communicable disease.

Later, during WWI, Harvard dentist Dr. Varaztad Kazanjian pioneered the integration of dentistry and plastic and reconstructive surgery. He used his prosthetic skills to rehabilitate the battle-ruined faces of 3,000 soldiers. Dubbed the "Miracle Man of the West," he was able to repatriate soldiers to a civilian life that otherwise would have been, as one soldier admitted, "unbearable." Because of the staggering nature of the injuries, the war had sanctioned the trial of new and drastic surgical procedures.

During WWII, the English surgeon Sir Harold Gillies was an innovative contributor in the reconstructive approaches of traumatic deformities. Civilian surgeons translated the new techniques to the treatment of congenital anomalies, allowing them to radically correct inherited facial malformations through bony facial surgery.

I wondered if war could have any other positive outcomes beyond advances in surgery. I came across an article by Peter Barkey,¹ Health Systems Public Relations at the University of Michigan, on a university study into "post-traumatic growth." He notes that anecdotal evidence suggests some former POWs not only adapt well to their trauma but also actually find personal growth and purpose from severe and overwhelming traumatic ordeals. This suggests that, for some military persons, coming to terms with terrible experiences can lead to psychological growth.

Despite medical progress, I still wonder how the devastation of war can counterbalance even these considerable scientific advances. The irony is not lost upon me. I appreciate the substantive surgical and medical knowledge that human casualties have provided but am no closer to reconciling war with societal progress. Like you, I hope for minimal civilian loss of life, the safe return of the troops, and enduring peace.

1. Barkey, Peter: Study of POWs will try to determine if traumatic experiences have positive outcomes [on-line]. *University Record* Jan 24, 2000. [Cited April 21, 2003.] <www.umich.edu/~urecord/9900/Jan24_00/16.htm>



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1. Platt K, Moritis K, Johnson MR, Berg J, Dunn JR. Philips Oral Healthcare. *Am J Dent* 2002;15(Special Issue):18B-22B. (versus Sonicare Advance)

2. Hope CK, Wilson M. University College London, Eastman Dental Institute. *Am J Dent* 2002;15(Special Issue):7B-11B. (in vitro study versus Braun Oral-B 3D)

3. Sorensen JA, Nguyen H. Oregon Health and Science University. *Am J Dent* 2002;15(Special Issue):26B-32B. (in vitro study versus Braun Oral-B 3D Excel)

4. 2002 U.S. Survey data



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EXECUTIVE DIRECTOR'S MESSAGE

CDHA'S TOP 10 ISSUES LIST FOR SPRING 2003

BY SUSAN ZIEBARTH, CHE

Why can't somebody give us a list of things that everybody thinks and nobody says, and another list of things that everybody says and nobody thinks?

— Oliver Wendell Holmes, Sr.

The following "top 10" list is slightly different from those wished for by Wendell Holmes—CDHA is not only thinking about but is also speaking up about these issues on its members' behalf. Here are the top 10 issues, in alphabetical order.

Access to oral care

Important in the past, access to oral health is now considered a critical issue with increased evidence that oral and general health are linked. In 1992, CDHA developed a guiding principle: "Every Canadian is entitled to access comprehensive oral health care."¹ CDHA is committed to attaining this goal by working in cooperation with provincial partners, government, health agencies, public interest groups, and other health professions.

"We are working to understand dental hygiene workplaces and to provide you with feedback regarding working conditions and salary."

Accreditation

The dental hygiene profession must assure government that dental hygienists are appropriately educated to serve the public. Accreditation is the quality assurance tool used to assess professional educational programs. The current accreditation commission (Canadian Dental Accreditation Commission) is part of the Canadian Dental Association and dental hygienists are finding it difficult to establish their own professional educational standards in this milieu. Currently all dental hygienist and dental regulatory and association bodies are looking for the best organizational structure for the accrediting body.

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MESSAGE DE LA DIRECTRICE GÉNÉRALE

LISTE DES 10 GRANDS ENJEUX — PRINTEMPS 2003

PAR SUSAN ZIEBARTH, CHE

Pourquoi personne ne peut nous donner une liste de choses auxquelles tout le monde pense et dont personne ne parle, et une autre liste de choses dont tout le monde parle mais auxquelles personne ne pense?

— Oliver Wendell Holmes Sr.

La liste des « 10 grands enjeux » qui suit est légèrement différente des souhaits de Wendell Holmes. Non seulement l'ACHD pense-t-elle à ces enjeux, mais elle en parle au nom de ses membres. Les voici :

Accès aux soins de la bouche

Déjà important par le passé, l'accès à la santé buccale est maintenant considéré, — avec les preuves de plus en plus nombreuses que l'état général de la santé et la santé buccale sont reliées —, comme l'un des enjeux critiques. En 1992, l'ACHD a élaboré un principe directeur : « Tout Canadien a droit à avoir accès à des soins complets de santé buccale¹. » L'ACHD s'est engagée à atteindre cet objectif en collaboration avec ses partenaires provinciaux, les gouvernements, les organismes de santé, les groupes d'intérêt public et les autres professions de la santé.

Accréditation

La profession de l'hygiène dentaire doit assurer le gouvernement que les hygiénistes dentaires reçoivent la formation pertinente pour servir le public. L'accréditation est l'outil d'assurance de la qualité servant à évaluer les programmes d'enseignement professionnel. La commission d'accréditation actuelle (Canadian Dental Accreditation Commission) faisant partie de l'Association dentaire canadienne, les hygiénistes dentaires ont de la difficulté à établir leurs propres normes d'enseignement professionnel dans ce milieu. Tous les organismes de réglementation et d'association en hygiène dentaire et en art dentaire sont actuellement à la recherche de la meilleure structure organisationnelle pour l'organisme d'accréditation.

Baccalauréat, niveau d'entrée à la pratique

L'enseignement donné aux hygiénistes dentaires doit évoluer constamment pour rester au diapason des changements qui surgissent dans les besoins de soins de santé des Canadiens. Une base de connaissances très largement étendue, une population vieillissante, une technologie avancée et des groupes élargis de clients ayant des préoccupations reliées à

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December 5, 2002

Dear Editor:

I would like to commend Judy Lux on a very well-researched, thorough, and well-written feature article, "The Fluoride Dialogue: CDHA Position Statements" [*Probe*, November-December 2002]. I do, however, have a couple of questions and suggestions and I would appreciate your comments.

1. Page 219, 1st column, last paragraph: "The fact that children younger than six are not at risk for enamel fluorosis suggests that fluoride mouth rinse may be appropriate for children older than six." The statement does not make sense and I wonder if it has been misquoted.
2. Position Statements, Bullet 2, page 221: Given the statement found on page 212, "This study concludes that the elimination of fluoride from infant formula would contribute significantly to reducing the prevalence of fluorosis," it seems to me that it would make more sense to recommend that infant formula always be prepared with non-fluoridated water.
3. Position Statements, Bullet 4, page 221: I do not think that the opening statement is emphatic enough in acknowledging that the recommendation for fluoride supplementation should be the exception rather than the rule. This could be accomplished by inserting the word "only," i.e., "Fluoride supplements should only be recommended in non-fluoridated areas for children at high risk for dental disease."

I look forward to your response.

Nicholas Kay

January 18, 2003

Dear Ms. Nicholas:

Thank you for your feedback on "The Fluoride Dialogue: CDHA Position Statements." I appreciate any feedback from members on *Probe* articles. Recently, a dental hygienist indicated that she used this fluoride research as part of a presentation to city council for their consideration in determining whether or not to implement water fluoridation. This is particularly rewarding since the fluoride research was used in a practical way to help the community.

Please find a response to each of your queries below.

1. Page 219, 1st column, last paragraph:

You are correct. The statement on page 219 should read, "The fact that children older than six are not at risk for enamel fluorosis suggests that fluoride mouth rinse may be appropriate for children older than six."

Commission on Dental Accreditation of Canada (CDAC) appoints Director

The Commission on Dental Accreditation of Canada announced that Ms. Susan Matheson has been appointed Director, effective 3 February 2003.

Ms. Matheson has been Acting Director since February 2001 and will continue to oversee the overall organization, management, and administration of the accreditation activities of CDAC.

2. Position Statements, Bullet 2, page 221: Your comment, "it seems to me that it would make more sense to recommend that infant formula always be prepared with non-fluoridated water."

There are a number of factors that contributed to the CDHA infant formula recommendation. The 2001 CDC report, *Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States*, indicates that "whether fluoride intake from formula that exceeds the recommended amount during only the first 10 to 12 months of life contributes to the prevalence or severity of enamel fluorosis is unknown." In addition, the study calling for the elimination of fluoride from infant formula used a small number of subjects (350) and the study was eight years older than the 2001 report. These two pieces of information suggest that further research may be needed before a strong recommendation can be made to remove fluoride from all infant formula. In addition, the implementation of the CDHA recommendation for developing an improved method for determining the optimal fluoride concentration in community drinking water will likely reduce the amount of fluoride found in infant formula.

3. Position Statements, Bullet 4, page 221: Your comment, "I do not think that the opening statement is emphatic enough in acknowledging that the recommendation for fluoride supplementation should be the exception rather than the rule. This could be accomplished by inserting the word 'only,' i.e., 'Fluoride supplements should only be recommended in non-fluoridated areas for children at high risk for dental disease.'"

The CDHA Board reviewed this issue and felt that the published statement best reflected the conclusions from the most up-to-date research.

Please contact me if you would like further clarification.

Yours sincerely,

Judy Lux
Health Policy Communications Specialist
Canadian Dental Hygienists Association 

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March 19, 2003

Editor, *Probe*
CDHA
96 Centrepoin Drive
Ottawa, ON K2G 6B1

The CDHA recently published a review of fluoride and related position statements ("*Probe*" Vol. 36 #6; Nov-Dec 2002). The 11-page article appears to be done with care and is well referenced. Nevertheless, at least one part of it may raise questions.

The review includes this position statement (one of many clauses): "Water fluoridation should be maintained and extended to additional communities where feasible. Infants past the age of 12 months should not consume formula made with fluoridated water." (page 221)

The statement appears to be based on several articles mentioned in a section that begins: "In 2001, the Centers for Disease Control and Prevention (CDC) in the US reported two studies confirming that consumption of infant formula beyond the age of 10 to 12 months is a risk factor for enamel fluorosis, especially when the formula concentrate was mixed with fluoridated water. Similar results were found in an Australian study...." (page 212)

Upon checking the CDC reference it appeared that the CDHA author adapted one sentence (adding the word: "confirming"), and did not include a crucial subsequent sentence. If she had stayed close to the original text in MMWR, the paragraph might instead be "In 2001, the Centres for Disease Control and Prevention (CDC) in the US reported two studies indicating that consumption of infant formula beyond the age of 10 to 12 months is a risk factor for enamel fluorosis, especially when the formula concentrate was mixed with fluoridated water. *These studies examined children who used pre-1979 formula (with higher fluoride concentrations).* Similar results were found in an Australian study..." (my emphasis) This more accurate representation takes on a different tone, and may not support the position statement.

The Australian studies appear to have been done before the manufacturers in that country consistently made formula concentrate with non-fluoridated water. Riordan's recent Australian study (Dental fluorosis decline after changes to supplement and toothpaste regimens. Riordan P. Community Dent Oral Epidemiol 2002 30 233-40) shows an impressive reduction in fluorosis linked to health promotion about fluoride toothpaste and supplements. The elimination of fluoride in Australian formula concentrate also occurred during the 10-year frame of the report, and may have contributed to the decline.

In addition, it seems that fluorosis risk would be related to the proportion of daily food intake consisting of formula. Few infants are 100% formula-fed after 12 months of age because they have teeth - so formula (or mother's milk) should not be the primary energy source. In such cases, wouldn't early childhood caries be a bigger risk?

It may be useful to know more about the process CDHA used to arrive at its position statement. Was it endorsed after full consideration and review? Was it an evidence-based review? Interpretation of the evidence by experts, and their analysis of the reporting language and style, can significantly enhance the credibility of position statements based on literature review.

Respectfully,
E. Luke Shwart, D.M.D., M.B.A.

April 23, 2003

Dr. E. Luke Shwart,
P.O. Box 4016, Stn. C
Calgary, AB Canada T2T 5T1

Dear Dr. Shwart:

RE: *The Fluoride Dialogue: CDHA Position Statements*

I have forwarded your letter regarding *The Fluoride Dialogue: CDHA Position Statements* to the author and am including her response to you directly. I hope this serves to clarify the concerns you expressed.

Sincerely,

Marilyn Goulding,
Scientific Editor of *Probe*

April 23, 2003

Dr. E. Luke Shwart,
P.O. Box 4016, Stn. C
Calgary, AB Canada T2T 5T1

Dear Dr. Shwart:

RE: *The Fluoride Dialogue: CDHA Position Statements*

Thank you for your letter dated March 19, 2003, describing some new research published in *Community Dental Oral Epidemiology*. This research appeared in the June 2002 issue of this journal, after the completion of the CDHA report. However, we will be updating the CDHA fluoride paper and will incorporate this new information into the paper at that time.

Your suggestion that the CDHA report has inaccurately adapted one word in a sentence from the Centers for Disease Control and Prevention publication is incorrect. The passage from which the information was taken reads as follows: "Two studies reported that extended consumption of infant formula beyond age 10-12 months was a risk factor for enamel fluorosis, especially when formula concentrate was mixed with fluoridated water."¹ This passage as you suggest was printed from the CDC web site at www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm on November 27, 2001. The CDHA report paraphrases the above quote as follows: "In 2001, the Centers for Disease Control and Prevention in the United States reported two studies confirming that consumption of infant formula beyond the age of 10 to 12 months is a risk factor for enamel fluorosis, especially when formula concentrate was mixed with fluoridated water." When the report is updated, we will add the passage as you suggested, indicating a high fluoride concentration formula was used in the two studies.

The CDHA position statement that infants past the age of 12 months should not consume formula made with fluoridated water is supported in another paper that will be incorporated into the fluoride paper revision. Clarkson and McLoughlin (2000) explore the role of fluoride in oral health promotion and suggest various methods to control fluorosis. They report that the risk of fluorosis resulting from the use of infant formulas has been reduced considerably as a result of the action of manufacturers in reducing the amount of fluoride in these products.² However, they still call for the preparation of infant formulas using non-fluoridated water.

Thank you for your comments.

Sincerely,

Judy Lux,
Health Policy Communications Specialist
Canadian Dental Hygienists Association 

1 Centers for Disease Control and Prevention: Recommendations for using fluoride to prevent and control dental caries in the United States. *Morbidity and Mortality Weekly Reports* 50: pp. 1-42, August 17, 2001

2 Clarkson, J. McLoughlin, J.: Role of fluoride in oral health promotion. *International Dental Journal* 50(3): pp. 119-128, 2000



MILK PRODUCTS: AN INVESTMENT IN ONE'S FUTURE



Milk during childhood and adolescence is the key to strong bones in later life.

Given the necessity of calcium for strong teeth and bones, telling kids about the importance of drinking milk and eating cheese and other dairy products is undoubtedly part of the dental hygienist's arsenal. The fact is, since peak bone mass is obtained by the time we reach our twenties,¹ the importance of adequate intake of dietary calcium during childhood and adolescence cannot be overstated. And dairy products during that time of life are key, since they have demonstrated persistent, long-term benefits to bone^{2,3} while those of calcium supplementation⁴ are transient, disappearing once supplementation is discontinued.⁵ Moreover, children who avoid milk rarely change their habits in adolescence and may reach adulthood with

low peak bone mass, making them more vulnerable to osteoporotic fractures later on.⁶

There is considerable evidence attesting to the importance of acquiring the "milk habit" early in life. Wang and colleagues examined the relationship between dietary calcium intake during adolescence and peak bone mass in 693 black and white women aged 21-24 years. Significantly higher total body bone densities were observed among those who'd had dietary calcium intakes of >1000 mg/day during mid-puberty, when bone appears to be most responsive to calcium.⁷ Similarly, a study by Teegarden and colleagues showed that adolescent milk intake was associated with significantly greater total body, spine and radial bone mineral measures ($p < 0.05$) in 224 women, aged 18-30 years.²

What's more, the evidence shows that the positive impact of early milk drinking persists well beyond young adulthood. Data from the NHANES III cohort of 3,251 white women indicated that among women aged 20 to 49 years, bone mineral content was 5.6% lower for those who consumed less than one serving of milk per week during childhood (5-12 yrs) than in those who consumed at least one serving per day.³ Low milk intake during adolescence (13-17 yrs) was associated with a 3% reduction in hip bone mineral content and density.³ Moreover, among women 50 years and older, low milk intake during childhood was associated with a two-fold greater risk of fracture.³ An accompanying editorial suggested that, had the servings been quantified, it's likely the true associations would have been even stronger.⁸

Milk provides calcium, protein, phosphorus, vitamin D, zinc and magnesium. All are important for the production of bone matrix and may have positive effects on bone growth and mineralization.³

References: 1. Cadogan J et al. 1997. Milk intake and bone mineral acquisition in adolescent girls: randomised, controlled intervention trial. *Br Med J* 315:1255-1260. 2. Teegarden D et al. 1999. Previous milk consumption is associated with greater bone density in young women. *Am J Clin Nutr* 69:1014-1017. 3. Kalkwarf H et al. 2003. Milk intake during childhood and adolescence, adult bone density, and osteoporotic fractures in US women. *Am J Clin Nutr* 77:257-265. 4. Lee WTK et al. 1996. A follow-up study on the effects of calcium-supplement withdrawal and puberty on bone acquisition of children. *Am J Clin Nutr* 64:71-77. 5. Lee WTK et al. 1997. Bone mineral acquisition in low calcium intake in children following withdrawal of calcium supplement. *Acta Paediatr* 86:570-576. 6. Black RE et al. 2002. Children who avoid drinking cow milk have low dietary calcium intakes and poor bone health. *Am J Clin Nutr* 76:675-680. 7. Wang M-C et al. 2003. Diet in midpuberty and sedentary activity in prepuberty predict peak bone mass. *Am J Clin Nutr* 77:495-503. 8. Tucker KL. 2003. Does milk intake in childhood protect against later osteoporosis? *Am J Clin Nutr* 77:10-11.



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ORAL AND PHARYNGEAL CANCER: KNOWLEDGE, OPINIONS, AND PRACTICES OF DENTAL HYGIENISTS IN BRITISH COLUMBIA AND NOVA SCOTIA

BY JOANNE B. CLOVIS,* PhD, ALICE M. HOROWITZ,** PhD, and DALE H. POEL,† PhD

ABSTRACT

Oral cancers demonstrate high mortality rates even though they are largely preventable and can be successfully treated when diagnosed at an early stage. Dental hygienists in British Columbia and Nova Scotia were surveyed regarding their knowledge, opinions, and practices about oral cancer. In February 1998, a pre-tested, 41-item survey was mailed to a random sample of dental hygienists in British Columbia and the dental hygienist population in Nova Scotia. A reminder postcard and one additional mailing were sent to non-respondents. Of the 606 dental hygienists supplying usable responses (response rate 70%: 66% in British Columbia, 73% in Nova Scotia), only 41.7% agreed that their knowledge was current. Most dental hygienists correctly identified tobacco use (98.8%) and alcohol use (92.1%) as real risk factors, but fewer identified non-risk factors correctly, and only 27.6% identified both erythroplakia and leukoplakia, in that order, as the conditions most likely associated with oral cancer. On 16 risk factors, the mean correct score was 8.5; on the 14 diagnostic procedures, the mean correct score was 9.3. Differences between the provinces were statistically significant ($p < 0.01$) on only five knowledge items. From eight health history items, the average number assessed was four, with most (88.9%) asking about the patient's history of cancer and present use of tobacco (88%). Oral cancer examination (OCE) was performed by 42.4% of dental hygienists at initial appointment for patients most at risk (≥ 40 years of age), but 24.9% never provided OCE for this older cohort at initial appointment. Undergraduate training regarding oral cancer examination was reported as good by only 41.5%. Nearly all dental hygienists (95.0%) were interested in taking continuing education courses. Overall, the oral cancer knowledge, opinions, and practices of dental hygienists in both provinces were disappointing. Increased undergraduate and continuing education programs are required to increase dental hygienists' knowledge of risk and diagnostic factors, appropriate health history assessment, and strategic interventions including tobacco cessation and early detection practices.

MeSH Key words: Canada; dental hygienists; knowledge, attitudes, practice; mouth neoplasms; professional practice

INTRODUCTION

In 1998, 1,022 Canadians died from oral cancers including 25 men and 10 women in Nova Scotia, and 80 men and 40 women in British Columbia—more deaths than those caused by each of malignant melanoma, uterine and cervical cancers, and Hodgkin's Disease.¹ The estimates for oral cancer for 2002 were 3,100 new cases and 1,050 deaths in Canada.¹ The numbers of new cases and deaths due to oral cancers are an important measure of burden on the Canadian population and health care system. Oral cancers collectively include those of the lip, tongue, floor of the mouth, gingivae, palate, buccal mucosa, vestibule, and salivary glands, whereas pharyngeal cancer includes cancers of the nasopharynx, oropharynx, and hypopharynx. Together they are more accurately termed "oral and pharyngeal cancers."^{1,2} For simplicity, the term used in this paper is "oral cancer."

In its morbidity, and probability of mortality, the burden of suffering associated with oral cancers is distinct from the other major oral diseases of dental caries and periodontal diseases. Oral cancers have a relatively low survival rate, a phenomenon generally attributed to late diagnosis³ with over 50% of oral cancers diagnosed at a late stage.^{4,5} Survivors are often disfigured by the cancer and the treatment. Unfortunately, these statistics have changed little over recent decades, and oral cancers continue to receive less attention than other cancers.

Important variables in oral cancers include age, racial origin, gender, and geography. Oral cancer risk increases with age and strong overall gender differences are reflected in the male-to-female ratios of new cases at 2.2:1 and deaths at 2.3:1.¹ Young females in British Columbia and in other countries are at a much higher risk than young males for basal cell carcinoma of the upper lip.⁶ Among the Inuit, rates for both the salivary gland and nasopharynx are 10 to 25 times higher than among the general Canadian population.⁵ Oral cancers also show geographic variation in their incidence and mortality. Rates tend to be above average in some Maritime provinces and lower in the three most western provinces.⁷ A comparison of incidence rates per 100,000 population, and age-standardized mortality rates for British Columbia, Nova Scotia, and Canada is provided in Table 1.

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RATES PER 100,000	BRITISH COLUMBIA	NOVA SCOTIA	CANADA
Incidence rates			
Males	10	13	12
Females	5	5	5
Age-standardized mortality rates			
Males	4	5	4
Females	2	2	2

Source: *Canadian Cancer Statistics 2002*. Toronto: National Cancer Institute of Canada, 2002

Table 1. Estimates of oral cancer incidence and mortality rates by province and gender for 2002

Several risk factors are well established. Most oral cancer may be attributed to the use of tobacco products that are smoked or chewed.² The combined use of tobacco and alcohol significantly increases one's risk of developing this cancer.² Other risk factors are actinic radiation for lip cancer, a lack of fruits and vegetables in the diet, and human papillomavirus.² Age itself is a risk factor as most oral cancer occurs in people older than 45 years.² Non-risk factors—those not supported by research but frequently believed to be a risk—include items such as hot beverages and food, obesity, use of spicy foods, poor oral hygiene, and poor-fitting dentures.²

The single most critical intervention influencing survival is early detection.^{2,8-11} Nearly 90% of all oral cancers are carcinomas occurring in stratified squamous epithelium.² Premalignant lesions, erythroplakia and leukoplakia, are the earliest detectable morphologic changes in the more common squamous cell carcinomas, with greater concern associated with erythroplakia.² About 91% of erythroplakic lesions show signs of dysplasia or malignancy at the time of diagnosis¹² while about 20% of leukoplakic lesions show evidence of dysplasia or carcinoma at first clinical recognition with the floor of the mouth and ventral surfaces of the tongue as high as 45%.¹³ Leukoplakia with an erythematous component, however, has a fivefold greater risk of malignant transformation than homogeneous leukoplakia.¹⁴ Verification of a premalignancy status always requires a biopsy.⁹

The oral cavity is easily accessible and can be examined with little discomfort in an efficient and timely screening protocol. The rationale for health care providers to perform routine oral cancer screening is persuasive: oral cancer, although serious, is treatable in its early stages; treatment to asymptomatic patients is usually acceptable and provides benefits over later treatment of symptomatic patients; the screening examination is inexpensive and safe; and the oral cancer examination offers health care providers an opportunity to identify and counsel patients about risk factors for cancers.^{15,16} Dental hygienists can readily incorporate the procedure into their routine examinations.^{10,11,17,18} The role and responsibility of the dental hygienist in screening for oral cancer in Canada is described in earlier publications.^{17,18} At the time of this study, however, there were no published survey results of dental hygienists' or dentists' knowledge and practices regarding oral cancer.

The examination for oral cancer includes a thorough history and a physical examination in which the clinician visually inspects and palpates the head, neck, oral, and pharyngeal regions.⁹ The history should include social and medical elements and a documentation of risk behaviours such as

tobacco and alcohol usage. Determination of risk is critical in assessing the potential for oral cancer and the need for tobacco cessation or other specific counselling to reduce risk.¹⁵ The examination procedure involves digital palpation of neck node regions, bimanual palpation of the floor of mouth and tongue, and inspection with palpation and observation of the oral and pharyngeal mucosa with an adequate light source and mouth mirror. The complete clinical examination takes less than two minutes to perform.^{8,11,19}

Studies of dental hygienists in the United States,²⁰⁻²² and dentists in the United States²³⁻²⁵ and Canada^{26,27} have assessed their knowledge, opinions, and practices regarding oral cancer. Results for both dentists and dental hygienists show that they are not as knowledgeable as they could be about oral cancer prevention and early detection practices, and that they could increase the number of risk factors probed during medical history-taking as well as the number of oral cancer examinations provided, especially for patients aged 40 or older.²⁰⁻²⁷

Differences among guidelines relating to oral cancer screening have likely contributed to the underutilization of screening techniques. In a Health Canada summary of eight sources of oral cancer screening guidelines,²⁸ only four recommend any form of oral cancer screening. Further, the preventive guidelines developed by three major national agencies in Canada and United States, the U.S. Preventive Services Task Force, the Canadian Task Force, and the American Cancer Society, are not in agreement regarding oral cancer screening.¹⁵ Only one, the American Cancer Society, recommends routine screening for oral cancer every three years for persons over 20 years of age and annually for those 40 years of age and older.²⁹ A recent Canadian analysis of oral cancer screening states there is a lack of evidence for the effectiveness of screening.³⁰ These dissimilar recommendations can be confusing to health professionals and can present a rationale for not providing the examination.¹⁵

The purposes of this study were to assess and describe dental hygienists' knowledge of oral cancer risk and diagnostic factors, their assessment of patients' oral cancer risk factors, their oral cancer examination practices for patients at initial and recall appointments, and their opinions with regard to their professional preparation to prevent and control oral cancer.

METHODS

Dental hygienist knowledge, opinions, and practices about oral cancer were determined in a single mail survey of a probability sample in British Columbia and the population in Nova Scotia with an established design, implementation, and analysis strategy.³¹⁻³³ A 41-item questionnaire was constructed from items previously tested for validity and reliability,^{24,25} as well as new ones unique to this survey. The survey instrument and design, including participant consent and information, received ethical approval from the Faculty of Graduate Studies at Dalhousie University. The instrument was validated in Canada and was pretested by convenience samples of dental hygienists in two non-survey provinces. A random sample of 516 dental hygienists licensed in British Columbia was selected by a digitized random numbers software program from the College of Dental Hygienists of British Columbia electronic listing of licensees in 1997 to provide a 95% confidence level for an expected return of 60%. The population of 378 dental hygienists in Nova Scotia were those

licensees provided in a list of addresses by the Nova Scotia Dental Hygienists Association (membership in the Association is mandatory for licensure in that province). Since the calculated sample size in Nova Scotia was nearly equal to the population, the population was selected for this study. In February of 1998, the questionnaire, cover letter, and an addressed, stamped envelope were mailed. A reminder card was sent two weeks later, and a second complete mailing was sent to all non-respondents four weeks after the initial mailing. All mailings were sequenced for same-day arrival in both provinces.

Responses were analyzed using SPSS-PC software (SPSS Inc., Chicago, IL). Data analyses were carried out using unweighted data. Bivariate analytical techniques and analysis of variance (ANOVA) were used, and all statistical results were evaluated using a significance level of $p < 0.01$.

Analyses of the mail survey data included the distributions of frequencies of 30 knowledge-related items, 16 on risk and 14 on diagnostic factors for oral cancer, and cross-tabular comparisons of these frequencies between the two provinces. On four of these items, using the Likert-type scale of agreement, the correct response was defined as the total of both those who agreed and those who strongly agreed or, similarly, the total of both those who disagreed and those who strongly disagreed. These aggregated categories allowed for correct response without penalty for degree of certainty on these items. Two knowledge indices were constructed to consolidate knowledge of risks and diagnostic factors. Each correct response to the 16 items regarding risk factors was given a score of 1 and all correct scores were added to yield an index of risk knowledge. Similarly, a diagnostic index was constructed by adding the number of correct responses to the 14 items of diagnostic knowledge.

Each index score was grouped into three approximately equal distributions by percentage to identify low, medium, and high scores. On the index of knowledge of oral cancer risks, respondents identifying 0 to 7 risk factors correctly were assigned a low score. Those with 8 or 9 correct items received a medium score, and a high score was given for 10 to 16 correct items. Similarly, on the index of knowledge of oral cancer diagnostics, respondents identifying 0 to 8 diagnostic factors correctly were assigned a low score. Those with 9 or 10 correct items received a medium score, and a high score was given for 11 to 14 correct items. These scores were used to construct a typology of dental hygienists' patterns of knowledge of oral cancer risks and diagnostics.

The association between the two indices, knowledge of risks and knowledge of diagnostics, was examined using one-way analysis of variance (ANOVA) to compare the mean aggregate scores of dental hygienists in the two provinces on both knowledge indices. The effects of six background characteristics on the risk and diagnostic indices were also assessed.

Eight questions about oral cancer risk factors assessed in taking patient health histories were analyzed. Dental hygienists were also asked for the percentage of patients for whom they provided oral cancer examinations in two age groups, 18 to 39 years, and 40 years or older, at both initial and recall appointments.

Finally, the relationships were analyzed between the dental hygienists' levels of knowledge and their opinions about how current their oral cancer knowledge was, the adequacy of their oral cancer training, the adequacy of their undergraduate education in this area, and their interest in participating in future oral cancer continuing education courses.

RESULTS

Results are based on 606 usable responses, representing an overall response rate of 70% (66% in British Columbia; 73% in Nova Scotia) of the dental hygienists deemed eligible to participate in this survey.

Characteristics of the respondents

Nearly all of the respondents (97.3%) were female, and 85.9% were employed in private practice settings (Table 2). Nearly half (45%) had graduated since 1990. More than half (63.4%) had taken a continuing education course on oral cancer within the past five years.

CHARACTERISTIC	BRITISH COLUMBIA		NOVA SCOTIA		BOTH PROVINCES OVERALL	
	%*	(No.)	%*	(No.)	%*	(No.)
Gender						
Male	3.3	(11)	1.9	(5)	2.7	(16)
Female	96.7	(320)	98.1	(254)	97.3	(574)
Type of practice						
General practice	89.0	(298)	82.0	(219)	85.9	(517)
Specialty practice	4.5	(15)	7.5	(20)	5.8	(35)
Public health or government	3.3	(11)	6.0	(16)	4.5	(27)
Dental hygiene education	2.4	(8)	3.0	(8)	2.7	(16)
Other	0.9	(3)	1.5	(4)	1.2	(7)
Time of graduation						
Before 1970	5.8	(19)	4.0	(10)	5.0	(29)
1970 to 1979	18.8	(62)	19.9	(50)	19.3	(112)
1980 to 1989	23.4	(77)	40.2	(101)	30.7	(178)
1990 to 1997	52.0	(171)	35.9	(90)	45.0	(261)
Interval since last oral cancer continuing education course						
Within past 12 months	21.0	(70)	9.1	(24)	15.7	(94)
Past 2 to 5 years	43.4	(145)	53.0	(140)	47.7	(285)
More than 5 years	15.9	(53)	16.7	(44)	16.2	(97)
New grad; have yet to attend	5.1	(17)	3.8	(10)	4.5	(27)
Never taken a course	13.8	(46)	17.0	(45)	15.2	(91)

* Some groups of percentages do not equal 100 due to rounding

Table 2. Characteristics of dental hygienist respondents

waterpik



DEFIANCE COMPLIANCE

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Knowledge of risk and non-risk factors

Regarding the real risk factors for oral cancer—that is, those that are supported by research—nearly all dental hygienists (98.8%) recognized tobacco as a high risk factor (Figure 1). Other high risk factors were correctly identified as prior oral cancer lesion (97.4%), and alcohol use (92.1%). Lip cancer related to sun exposure was correctly identified by 60.2%. Correct responses for several risk items were low: 41.3% correctly identified human papillomavirus and only 33.5% recognized low consumption of fruits and vegetables. Although 75.7% knew that older age is a high risk factor, only 26.6% identified that the age of majority with oral cancer is 60 years of age or older. More dental hygienists in British Columbia correctly identified alcohol use as a real risk factor (95.0%) than dental hygienists in Nova Scotia (88.5%) ($p < 0.01$).

Non-risk factors—those not supported by research—were identified correctly overall by fewer respondents (Figure 2). More than half knew that hot beverages and food (67.7%), obesity (63.9%), use of spicy foods (61.7%), and poor oral hygiene (54.1%) are not real risk factors. Fewer than half recognized several non-risk factors: familial clustering of cancer (31.4%), poor-fitting dentures (20.6%), and family history of cancer (5.8%). Responses on one non-risk item were statistically different between the provinces: more dental hygienists in Nova Scotia (27.1%) than in British Columbia (15.4%) correctly identified poor-fitting dentures as a non-risk factor ($p < 0.001$).

Scores on the overall 16-item index of dental hygienists' knowledge of oral cancer risks ranged from 0 to 14. On average, 8.5 of the 16 risk items were correct (8.4 in British Columbia; 8.5 in Nova Scotia). (See Table 3.) There were no statistically significant differences between the provinces in the mean risk score.

				95% CONFIDENCE LEVEL	
KNOWLEDGE INDICES	NO.	MEAN	SD	Lower bound.	Upper bound.
Risks index (16 items)					
All dental hygienists	606	8.5	2.3	8.3	8.7
British Columbia	337	8.4	2.2	8.2	8.7
Nova Scotia	269	8.5	2.5	8.2	8.8
Diagnostics index (14 items)					
All dental hygienists	606	9.3	2.5	9.1	9.5
British Columbia	337	9.7**	2.4	9.4	9.9
Nova Scotia	269	8.9	2.5	8.6	9.2

** Differences significant at $p \leq .001$

Table 3. Comparison of means of knowledge of risks and diagnostics indices

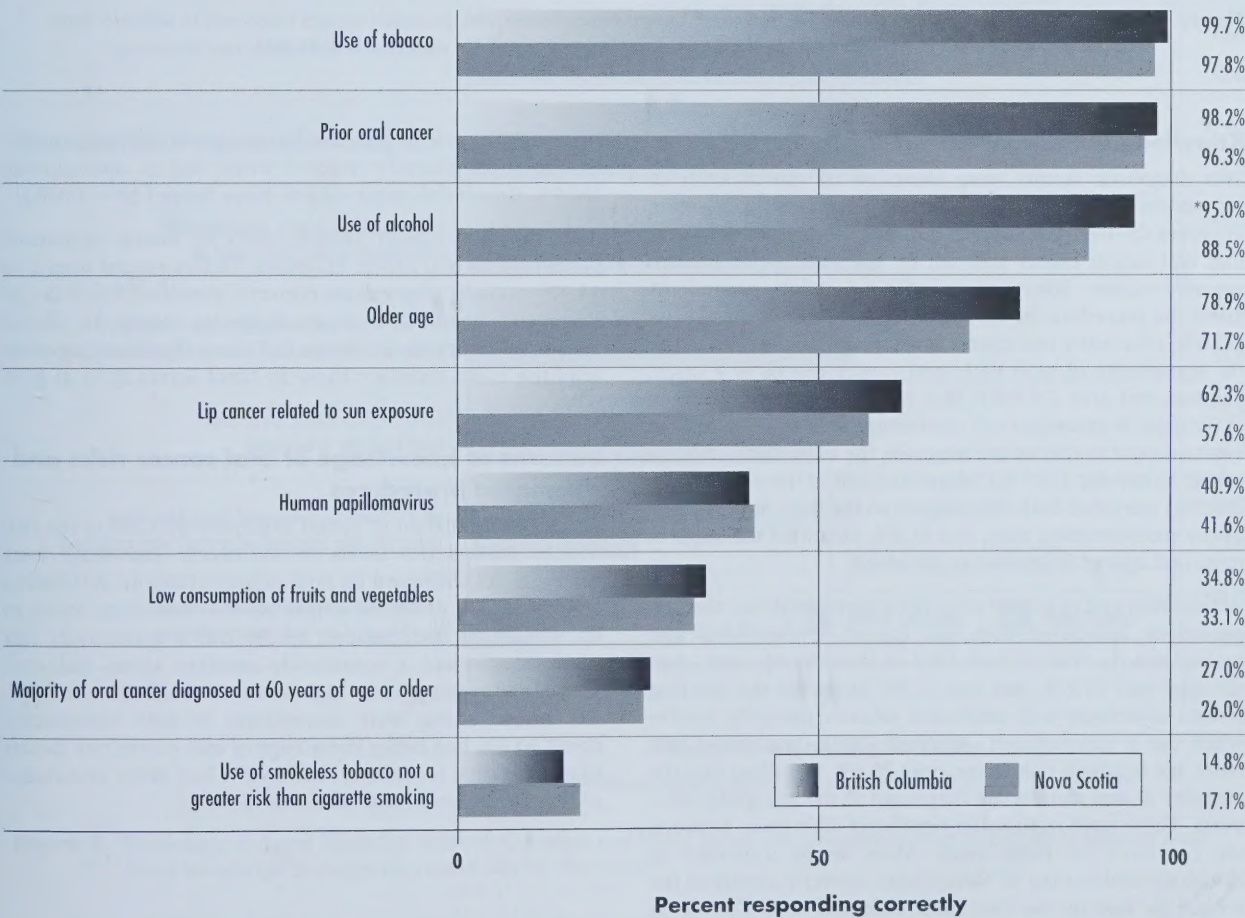


Figure 1. Percentage of dental hygienists in British Columbia and Nova Scotia who provided correct responses to selected items about knowledge of real risk factors for oral cancer

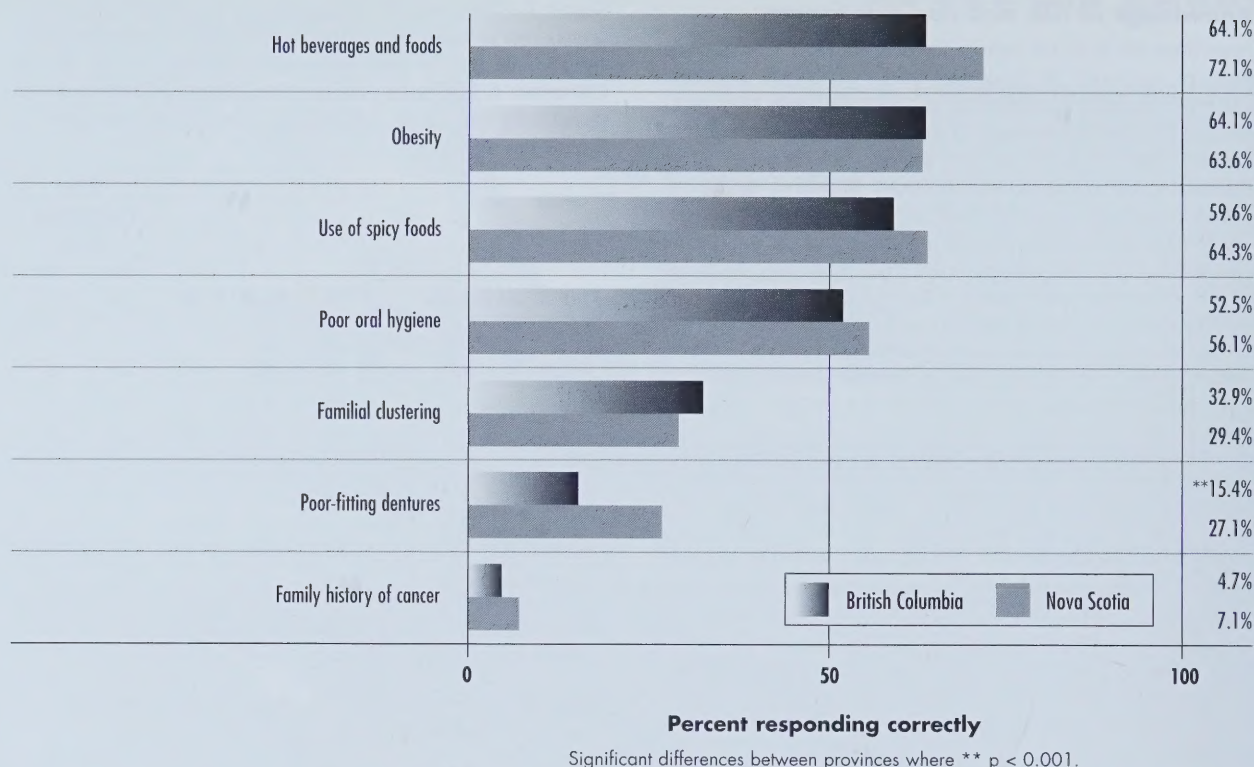


Figure 2. Percentage of dental hygienists in British Columbia and Nova Scotia who provided correct responses to selected items about knowledge of factors that have not been shown to pose any risk for oral cancer (non-risk)

Knowledge of diagnostic factors

Two diagnostic factors were identified by the majority of respondents (Figure 3). These factors are that early detection improves the five-year survival rate (identified by 92.9%) and that oral cancer exams may not be discontinued after three negative exams (identified by 89.6%). Most respondents knew the procedure for complete examination of the tongue (91.6%); that early oral cancer is asymptomatic (85.8%); that the appearance of most early oral cancer lesions is a small, painless, red area (76.9%); that the most common form of oral cancer is squamous cell carcinoma (67.5%); and that the ventral-lateral border of the tongue is the most likely area for cancer to develop (65.7%). More than half of the respondents (58.3%) identified both the tongue and the floor of the mouth as the most common sites, and 51.3% identified the stage of most oral cancer diagnoses as advanced.

At the lower end of correct responses were two items: the two conditions associated with oral cancer, erythroplakia and leukoplakia (in order of their level of association), were identified by only 27.6%, and just 22.8% identified the fact that lesions associated with smokeless tobacco generally resolve when use is discontinued. Although 75.7% recognized that older age is a high risk factor, only 26.6% identified that the majority of oral cancers are diagnosed in the age group 60+ years. There were statistically significant differences between the provinces for three items. More dental hygienists in British Columbia than in Nova Scotia correctly identified the tongue as one of the two most common sites (76.9% in British Columbia; 67.3% in Nova Scotia) ($p < 0.01$); the ventral-lateral border of the tongue as the most likely site on the tongue (73.0% in British Columbia; 56.5% in Nova Scotia)

($p < 0.001$); and the fact that lesions associated with smokeless tobacco generally resolve when use is discontinued (30.9% British Columbia; 12.6% Nova Scotia) ($p < 0.001$).

Scores on the overall 14-item index of dental hygienists' knowledge of oral cancer diagnostic factors ranged from 2 to 14. On average, respondents correctly identified 9.3 of the 14 diagnostic items. The mean diagnostic score for dental hygienists in British Columbia (9.7) was significantly greater than the mean score for those in Nova Scotia (8.9) at $p < 0.001$ (Table 3).

Patterns of knowledge of oral cancer risks and diagnostic procedures

A cross-classification of dental hygienists on each of the two indices showed that levels of oral cancer knowledge were generally not consistent on both indices (Table 4). Although a total of 40.9% of dental hygienists had consistent levels of knowledge on both indices, 14.2% had a consistently low score, 11.4% had a consistently medium score, and only 15.3% had a consistently high score. Of those dental hygienists whose scores were inconsistent in both dimensions, about 30.8% had better knowledge of oral cancer risk factors than diagnostic procedures, and 28.2% had better knowledge of diagnostic procedures than risk factors.

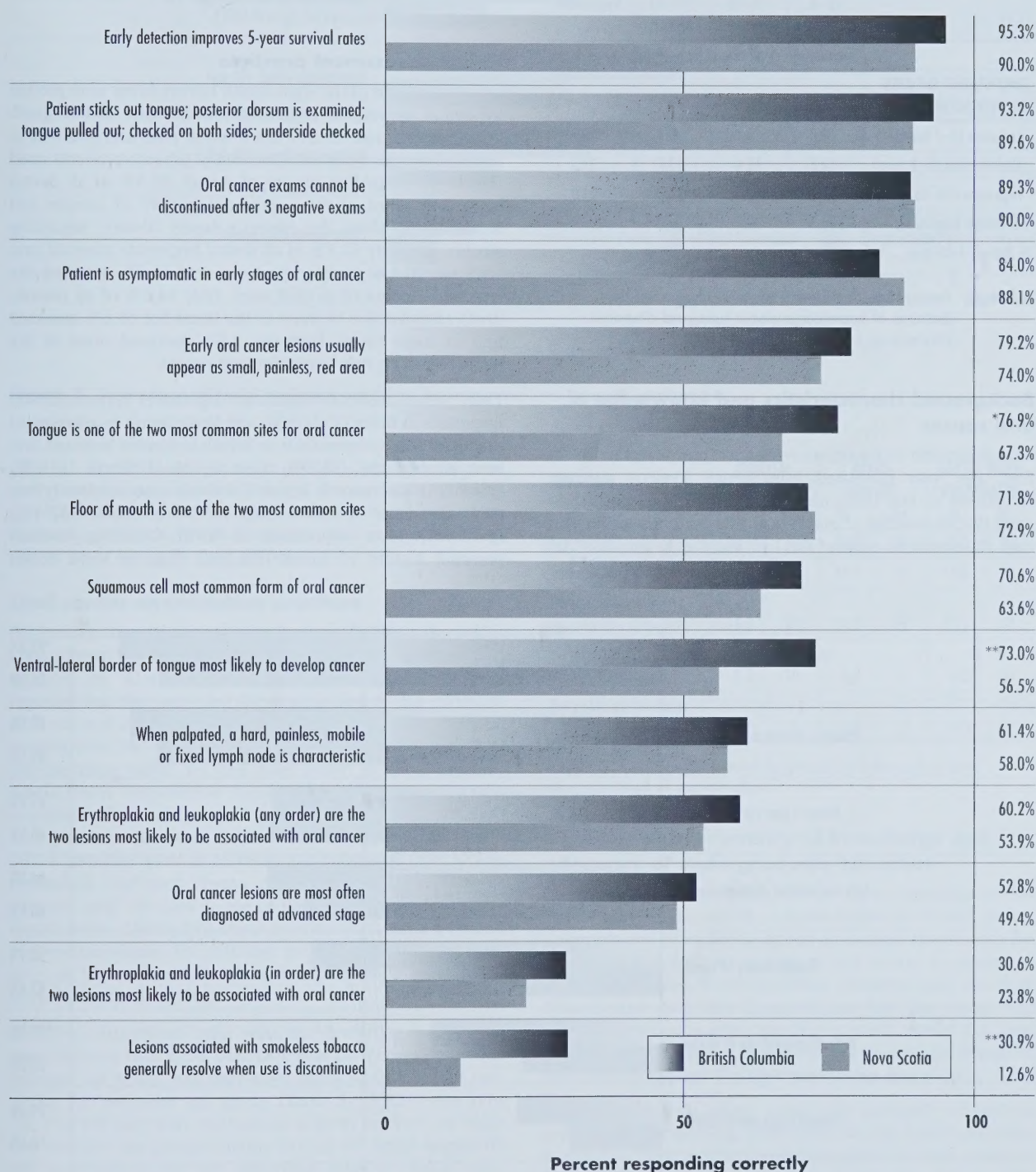


Figure 3. Percentage of dental hygienists in British Columbia and Nova Scotia who provided correct responses to selected items about knowledge of diagnostic procedures for oral cancer

	KNOWLEDGE OF DIAGNOSTIC PROCEDURES ^b			
	Low score (0–8 items)	Medium score (9–10 items)	High score (11–14 items)	All dental hygienists
	Percentage of all dental hygienists			
KNOWLEDGE OF RISK FACTOR SCORE^a				
Low score (0–7 items)	14.2	8.1	6.4	28.7
Medium score (8–9 items)	12.2	11.4	13.7	37.3
High score (10–16 items)	8.9	9.7	15.3	34.0
All dental hygienists	35.3	29.2	35.5	100.0

a. Total of 16 risk items b. Total of 14 diagnostic items

Table 4. Percentage distribution of dental hygienists by patterns of knowledge about risks and diagnostic procedures for oral cancer

Background characteristics and knowledge of oral cancer

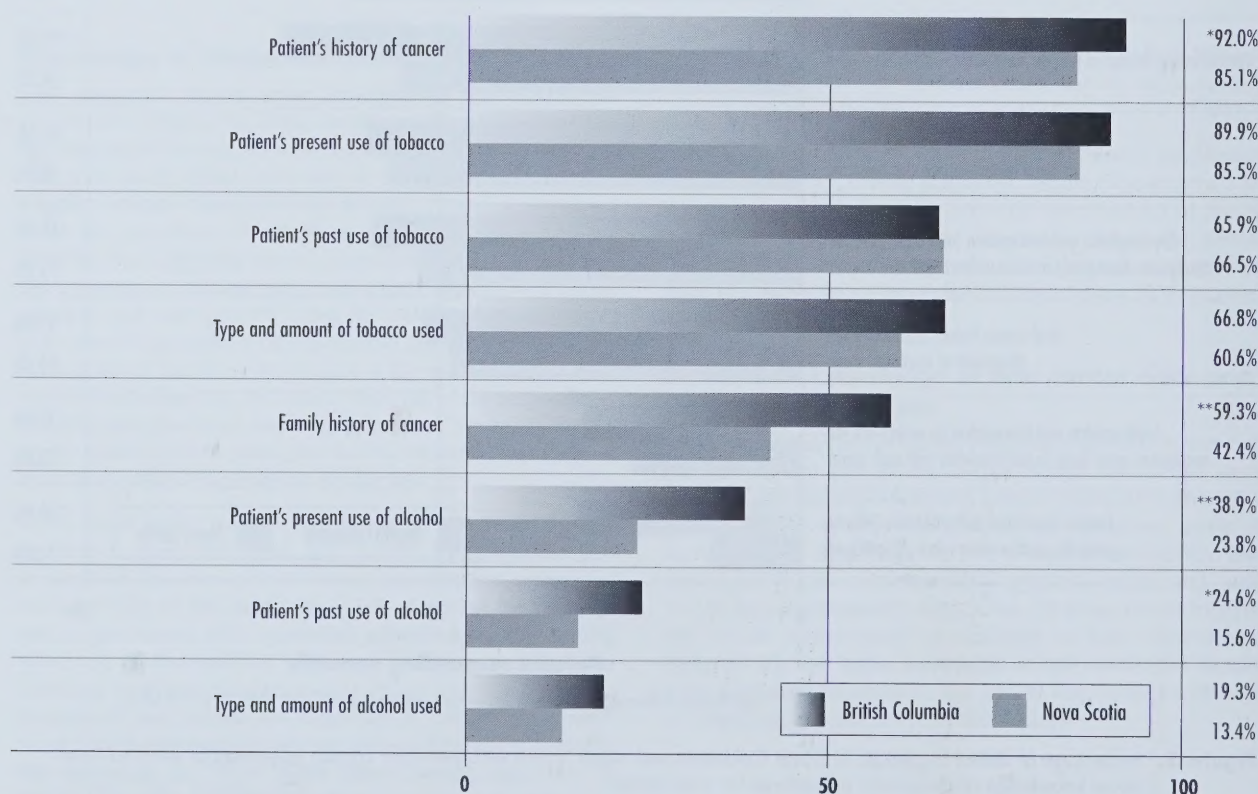
Six background characteristics—gender, primary practice setting, age, year graduated from dental hygiene program, recentness of last continuing education course, and agreement that knowledge of oral cancer was current—were examined in relation to each of the two knowledge indices. Only

agreement that knowledge was current was significantly associated with the knowledge of risk index ($p < 0.001$). Several background characteristics were significantly associated with the knowledge of diagnostics index: agreement that knowledge was current, year of graduation, and recentness of continuing education course ($p < 0.001$).

Health assessment practices

On average, four of the eight health history items were probed by dental hygienists. Regarding tobacco use, 88.0% questioned current use, 66.2% asked about past use, and 64.0% asked about the types and amounts of tobacco products used (Figure 4). Regarding history of cancer, 88.9% of all dental hygienists asked about a personal history of cancer and 51.8% asked about the patient's family history. Regarding alcohol use, only 32.3% of all dental hygienists assessed present use, 20.6% assessed past use, and 16.7% assessed the type and amount of alcohol used. Only 44.0% of all respondents assessed five or more of the items but 65.6% assessed four or more items. However, 4.5% assessed none of the items regarding risk factors for oral cancer.

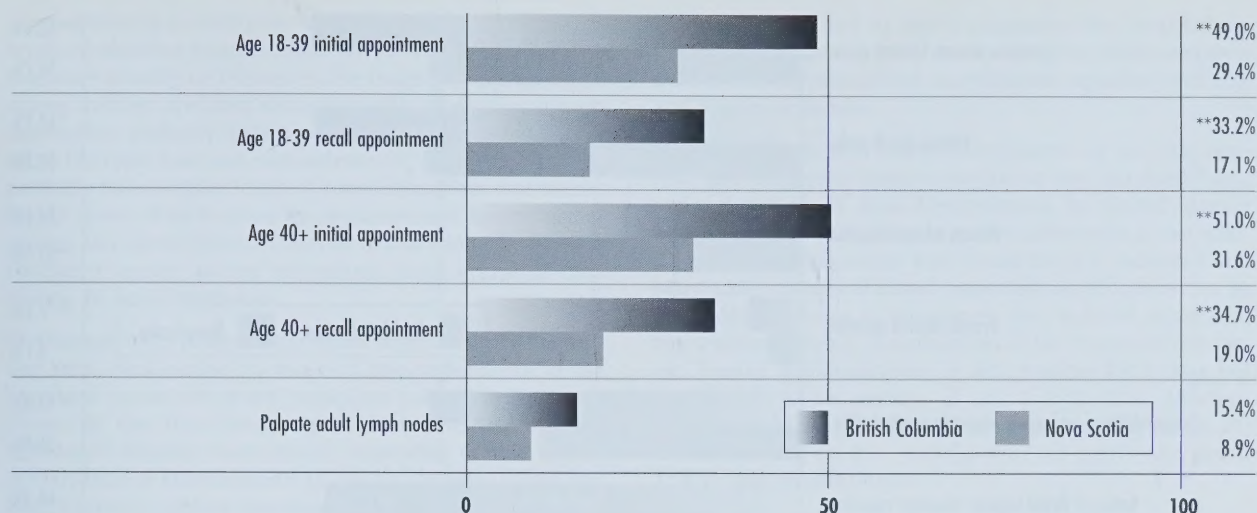
There were statistically significant differences between dental hygienists in British Columbia and Nova Scotia in assessment practices. More respondents in British Columbia assessed present alcohol use (38.9%) than in Nova Scotia (23.8%) ($p < 0.001$) and more in British Columbia assessed family history of cancer (59.3%) than in Nova Scotia (42.4%) ($p < 0.001$). More respondents in British Columbia assessed personal history of cancer (92.0%) than in Nova Scotia



Percentage of dental hygienists assessing selected items

Significant differences between provinces where * $p < 0.01$ and ** $p < 0.001$.

Figure 4. Percentage of dental hygienists asking selected questions about health history



Significant differences between provinces where ** $p < 0.001$.

Figure 5. Percentage of dental hygienists providing recommended oral cancer examinations

(85.1%) ($p < 0.01$) and more in British Columbia assessed past alcohol use (24.6%) than in Nova Scotia (15.6%) ($p < 0.01$). Overall, the average number of items probed by dental hygienists in British Columbia (4.6) was greater than that in Nova Scotia (3.9) ($p < 0.001$).

Oral cancer examination practices

Performing an oral cancer examination (OCE) at the initial appointment for all patients 40 years of age or older was reported by 42.4% of all dental hygienists, and 27.7% reported that they provided the examination to this cohort of patients that often at recall appointments (Figure 5). Of the respondents, 24.9% of respondents indicated that they never provide these exams for this older cohort at initial appointment. Fewer respondents reported performing oral cancer examinations for all younger patients aged 18 to 39 years: 40.3% always provided them at initial appointments while 26.1% provided them at all recall appointments. Only 12.5% responded that they always palpate the lymph nodes of patients aged 18 years of age or older; 58.7% never palpate lymph nodes. Dental hygienists in British Columbia provided more examinations for both age groups, age 18-39 and age 40+, at both the initial and recall appointments, than those in Nova Scotia ($p < 0.001$).

Of those respondents who were not providing oral cancer examinations, only 6.3% said OCE was not necessary for the younger age group, and only 4.5% reported OCE as not necessary for the older age group (Table 5). Nearly one-third (29.3%) felt they were not trained to do so for both the older and younger age groups. About 20% of all dental hygienists felt examinations for any age group take too much time. Another 20% felt examinations were either provided by the dentist or were the dentist's responsibility. More dental hygienists in Nova Scotia (32.5%) said they were not trained than those in British Columbia (26.1%), and more dental hygienists in Nova Scotia (24.2%) than in British Columbia (16.0%) also said it was the dentist's responsibility.

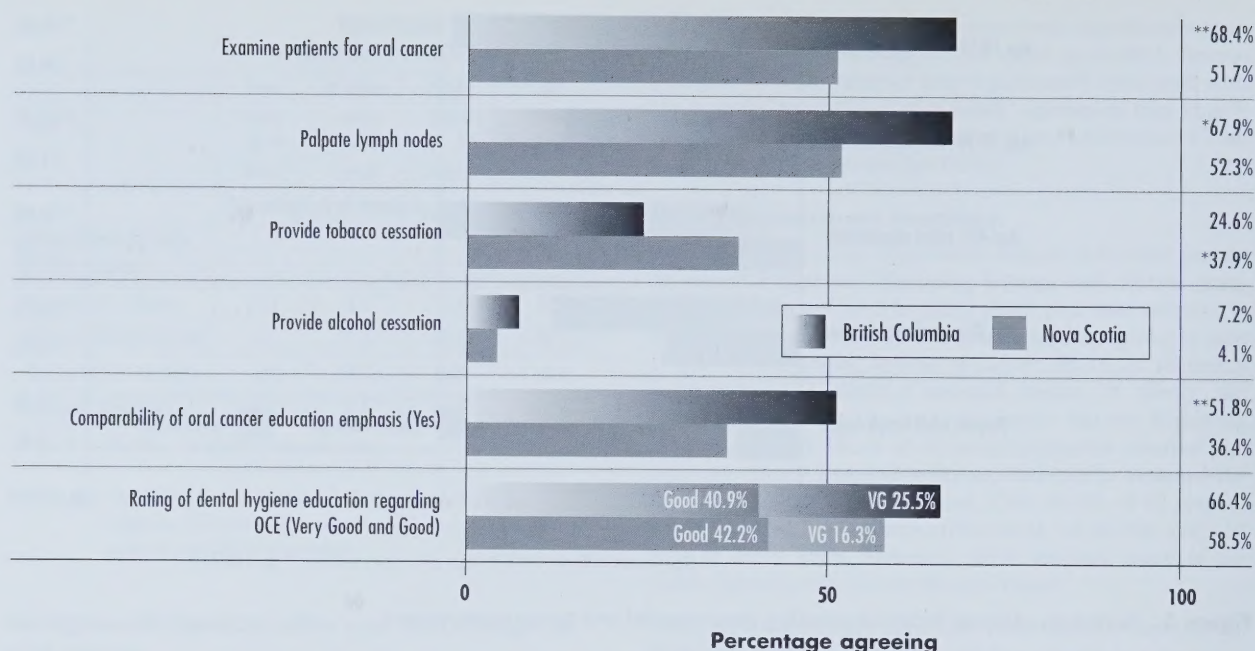
REASONS	BRITISH COLUMBIA		NOVA SCOTIA		ALL IN BOTH PROVINCES	
	%	No.	%	No.	%	No.
Not trained	26.1	31	32.5	39	29.3	70
Takes too much time	19.3	23	19.2	23	19.2	46
Dentist provided or responsibility of dentist	16.0	19	24.2	29	20.1	48
Not necessary for clients aged 18-39	7.8	10	4.8	6	6.3	16
Not necessary for clients aged 40 and older	6.7	8	2.4	3	4.5	11

Table 5. Reasons for dental hygienists not providing oral cancer examinations

Opinions about currency of knowledge and adequacy of undergraduate education

In response to the question whether their knowledge of oral cancer was current, 40.9% of dental hygienists in both British Columbia and Nova Scotia agreed or strongly agreed with the statement that their knowledge of oral cancer is current. A large proportion—36.4% in British Columbia and 50.2% in Nova Scotia—said they disagreed that their knowledge was current. Very few in either province strongly agreed that their knowledge was current; more respondents strongly disagreed than strongly agreed that their knowledge was current.

The respondents' beliefs about the adequacy of several aspects of their training with regard to oral cancer are summarized in Figure 6 with percentages given for each province. Collectively, only 61.2% of all respondents agreed or strongly agreed that they were trained to provide an oral cancer examination while as many as 83.4% agreed or strongly agreed that dental hygienists, in general, were adequately trained to do so. In total, 61.0% of all respondents agreed or strongly agreed that they were trained to palpate lymph nodes, but fewer (54.4%) reported feeling comfortable performing this procedure. Nearly one-third (30.1%) of all dental hygienists strongly agreed or agreed that they were adequately trained to



Significant differences between provinces where * $p < 0.01$ and ** $p < 0.001$.

Figure 6. Opinions of dental hygienists regarding adequacy of oral cancer training. OC = oral cancer, VG = very good

provide tobacco cessation education but only 5.8% strongly agreed or agreed that they were adequately trained to provide alcohol cessation education.

In reply to the question, "In your opinion, did your dental hygiene program address oral cancer examinations similarly to other procedures in terms of numerical requirements and the receipt of credit?" 44.1% responded yes. When asked to rate their undergraduate training regarding oral cancer examinations as either *very good*, *good*, *poor*, *very poor*, or *not sure*, 21.0% of respondents said *very good* while 41.0% reported it as only *good*.

There were statistically significant differences between dental hygienists in British Columbia and Nova Scotia on several of their opinions about training for oral cancer (Figure 6). In nearly all of these cases, British Columbia respondents' opinions were significantly more positive than those of Nova Scotia: knowledge of oral cancer is current ($p < 0.001$), trained to examine patients for oral cancer ($p < 0.001$), trained to palpate lymph nodes ($p < 0.01$), their school treated oral cancer examination similarly to other procedures ($p < 0.001$), and recentness of continuing education course on oral cancer ($p < 0.01$). In contrast, more Nova Scotia respondents believed they were trained to provide tobacco cessation ($p < 0.01$). Only about 5% of all respondents believed they were prepared to provide support for alcohol cessation.

Interest in, and preferred educational approaches for, oral cancer continuing education

Nearly all dental hygienists (95%) reported wanting to attend more continuing education courses on oral cancer. The two most preferred approaches to continuing education on oral cancer were clinical demonstration (45.0%), and audiovisual slides and tapes (20.6%). Fewer dental hygienists selected booklets with self-test (8.6%), lectures (7.4%), study clubs

(6.2%), or continuing education journals (4.2%). Only 3.0% chose computer programs. More dental hygienists in Nova Scotia than in British Columbia preferred clinical demonstration as their first choice ($p < 0.001$).

DISCUSSION

At the time of this study, predictions of incidence and mortality of oral cancer were somewhat higher than is currently estimated. Further, there were no published results of dental hygienists' knowledge and practices that would influence the direction of this research. Although the response rate to this survey was lower than one would like, it was based on a conservative assessment. Only those dental hygienists who responded stating they were not in clinical practice at that time were omitted from the target population. All surveys not returned, returned but stamped "address unknown," or returned unopened were included in the target population. The overall response rate of 70% is higher than the U.S. national study at 65%²² and the Maryland study at 60%,²⁰⁻²¹ and somewhat higher than that of other recent surveys of health practitioners.³⁴ While the results, based on unweighted data, may not be generalized to all dental hygienists in British Columbia, they do represent the population of dental hygienists in Nova Scotia.

To determine if the non-respondents were different from the respondents, verification of the characteristics of non-respondents was attempted through communication with the regulatory bodies in each province. The College of Dental Hygienists of British Columbia confirmed that the respondents in this survey were similar to those licensed at that time regarding age, gender, year of graduation, with the highest level of education for the vast majority being the diploma level. Correspondingly, the registrar in Nova Scotia confirmed these characteristics for the general population of practising dental hygienists in that province. Any bias associated with

non-response is probably in the direction of higher reported levels of assessing patients' risks and providing examinations than may actually be the case in the target population. These survey findings are likely consistent with others that suggest respondents probably have a greater knowledge of and interest in the topic than non-respondents.²⁰⁻²⁷ That is, the results probably reflect higher levels of knowledge about oral cancer, higher levels of oral cancer examination and health history taking, and higher levels of interest in oral cancer continuing education courses among responding dental hygienists than among all dental hygienists.

The background characteristics of the respondents to this survey were very similar to those of the respondents in the Maryland survey of dental hygienists published in 2001.²⁰ Those of the U.S. survey (published in 2001) are not reported.²² Slightly more males responded to this survey ($n = 11$) than in Maryland ($n = 2$), but nearly 90% in both surveys worked in general practices.

The knowledge of risk factors demonstrated that dental hygienists in British Columbia and Nova Scotia were able to identify most of the real risk factors, particularly use of tobacco (98.8%) and alcohol (92.1%), and more than half identified older age (75.7%) and lip cancer related to sun exposure (60.2%) as risk factors. However, although three-quarters identified older age as a risk factor, only one-quarter knew that the majority of oral cancer is diagnosed at 60 years of age or older. Dental hygienists were much less certain about non-risk factors. The smaller proportions of dental hygienists who correctly reported factors as being non-risk—such as familial clustering of cancer (31.4%), poor-fitting dentures (20.6%), and a family history of cancer (5.8%)—indicate a relatively high level of misinformation among these practitioners (Figure 1).

Similarly, dental hygienists' knowledge of diagnostic procedures also indicates specific areas of misinformation or lack of information. While nearly everyone understood that early detection improves five-year survival rates, only half (51.3%) knew that most oral cancer is diagnosed at a late stage. Although 72.6% knew that the tongue is one of the two most common sites and 72.3% knew that the floor of the mouth is one of the two most common sites, only 58.3% knew both of these sites. Finally, although current evidence clearly shows that red lesions or red-and-white mixed lesions are considered the most likely associated with oral cancers, only about one-quarter (27.2%) correctly identified erythroplakia and leukoplakia, in that order, as the two lesions most likely to be associated with these cancers. This very low level of knowledge about key diagnostic factors demonstrates that, even though many dental hygienists report they are providing oral cancer examinations, they may not know what is important to look for and where the most high risk sites are located.

The highly significant relation between scores on both indices and agreement that their knowledge is current suggests that dental hygienists in both provinces are aware of their level of knowledge and those levels are consistent with the scores on the knowledge items. The highly significant relationship between scores on both indices and year of graduation may reflect increasing attention regarding oral cancer in the dental hygiene curriculum in more recent years. Similarly, the highly significant relationship between high scores on the diagnostic index and recentness of continuing education course tends to affirm the positive effect of continuing education. Although these are clear indications of the benefits of recent education,

the small proportion of dental hygienists who held consistently high scores on both indices (15.3%) demonstrates a need for further educational interventions regarding both risk and diagnostic factors.

Overall, the pattern of correct identification of real risk, non-risk, and diagnostic items is similar to the Maryland²⁰ and national surveys of dental hygienists in the United States²² with few meaningful differences. The differences in the number of items in this survey and in both the U.S. national²² and Maryland²⁰ surveys of dental hygienists are accounted for by the additional items in this survey, two real risk items, and five diagnostic items. A comparison of the important risk factor, human papillomavirus, is not possible as it was not included in earlier surveys of dental hygienists. Although scores were slightly higher on this survey for a few items, differences among the three surveys were not great—only about 12% or less on most items.

Dental hygienists in both provinces demonstrated a wide acceptance of the practice of assessing patients' current tobacco use. Fewer dental hygienists determined patients' previous tobacco use (which indicates ongoing risk) and the types of tobacco used (which provide information about locations in the mouth to be examined with extra care). In addition to determining risk for oral cancer, dental hygienists can provide tobacco cessation programs. Fewer than one-third of dental hygienists assessed current alcohol use and fewer still assessed past alcohol use or types of alcohol used. As more than 90% of all dental hygienists in this survey knew that alcohol is a risk factor for oral cancer, these low assessments of alcohol use are not related to a lack of knowledge but more likely are related to a level of discomfort in addressing this risk with patients. These results for assessment of tobacco use are similar to the Maryland state study.²¹ They are, however, only about half of the Maryland responses for assessment of alcohol use.²¹

While it is recognized that clinical practices are influenced by practitioner knowledge, attitudes, beliefs and values,¹⁵ there was a conspicuous distinction in this study between knowledge levels and the application of knowledge in the provision of oral cancer examinations. The oral cancer examination practices clearly demonstrate missed opportunities important in the early detection of oral cancer. Although almost no one said they were unnecessary, fewer than half of dental hygienists provided oral cancer examinations to all patients aged 40 years or older at initial appointments, and more than one-quarter never provided examinations for this cohort. Some of these practice gaps may be explained by the lack of training expressed by nearly one-third of dental hygienists, but one-fifth of all dental hygienists believed it was the dentist's role or was provided by the dentist, and another fifth felt that the examinations required too much time. The rationale of a perceived lack of time must be questioned. In relation to other care that is normally performed by a dental hygienist, ensuring that a death-defying procedure is provided must never be perceived as taking too much time.

Different undergraduate and postgraduate educational opportunities may partially explain the differences between the provinces, as well as different regulatory requirements and expectations. In Nova Scotia, regulation requires direct supervision of dental hygienists by dentists. There may be more expectation that oral cancer examination is the role of the dentist in this case. In contrast, the regulation in British Columbia permits dental hygienists to establish their own

practices, and the College of Dental Hygienists of British Columbia has established statements that are intended to guide dental hygiene practice, including standards of practice and a scope of practice statement with an interpretation. Regarding oral cancer examination, the *Registrant's Handbook* available at the time of the survey has a scope of practice statement referring to the gathering or updating of information by the dental hygienist and includes head and neck examination and intra-oral soft tissue examination.³⁵ Practice Standard 8.1 under Clinical Assessment includes both observation and palpation in the collection of baseline personal and clinical information.³⁵ Both statements may be interpreted as requiring an oral cancer examination as recommended.^{8,11} Data on oral cancer examination practices of dental hygienists from comparable surveys in Maryland and all of the United States are not published.

It is highly likely that the differences among guidelines relating to oral cancer screening have contributed to professional misunderstanding and the underutilization of simple and effective screening techniques. In the Health Canada summary of eight sources of oral cancer screening guidelines,²⁸ only four recommend any form of oral cancer screening, from periodic screening of tobacco users to annual examination. An obvious lack of consensus among the preventive guidelines developed by the U.S. Preventive Services Task Force, the Canadian Task Force, and the American Cancer Society contributes to disagreement among practitioners and organizations regarding the value of oral cancer examinations and can serve as a rationale for not providing this simple and efficient screening.¹⁵ Of the three authorities, only the American

Cancer Society recommends routine screening every three years for persons over 20 years of age and annually for those 40 years of age and older.²⁹ The more recent Canadian analysis of oral cancer screening that supports the earlier Canadian Task Force's lack of recommendation for routine OCE suggests, however, that the problem is a lack of evidence rather than a lack of effect.³⁰ *This position reaffirms that an absence of evidence of a benefit is not the same as evidence of no benefit.*

A further complication in accurately determining incidence is that the prevalence and relatively low incidence of oral cancers have reported comorbidity with other upper aerodigestive cancers.¹⁵ The actual prevalence and incidence are likely to be higher than currently reported. Practically, an oral cancer examination requires only a few minutes, a reasonable cost for a procedure of such benefit to patients. "Inasmuch as scientific and cost-effective parameters used to support preventive guidelines are still being defined, current guidelines should not deter the application of available and effective technologies."¹⁵

In this study, dental hygienist opinions about their training revealed both consistencies and inconsistencies regarding their beliefs and performance. Fewer than half agreed or strongly agreed that their knowledge was current and this was reflected in their knowledge scores. Similarly, fewer than half said they were trained to palpate lymph nodes and about the same proportion reported feeling comfortable performing this procedure. These consistencies confirm the critical role of education, both undergraduate and continuing, in preparing practitioners with adequate knowledge and skills. On the other hand, the majority rated their undergraduate education in prevention and early detection of oral cancer as good or very good even though fewer than half also reported that their school placed less emphasis on this topic. Although a very large proportion (over 80%) believed that dental hygienists are adequately trained to provide oral cancer examination, a smaller proportion (about 60%) felt that they themselves were trained to do so.

The most disturbing results regarding educational preparation are the small proportions who felt prepared to provide counselling for the two highest risk factors, tobacco and alcohol use. Fewer than one-third agreed or strongly agreed they were trained to provide tobacco cessation counselling, and the number who were trained to provide alcohol cessation counselling was almost negligible. Cessation programs for tobacco are well established and counselling strategies are well known.³⁶ Although counselling for alcohol use may be less well established among health care practitioners, both alcohol and tobacco cessation should be included in dental hygiene curricula and continuing education to effectively address the two highest risk factors, which are even more destructive when combined.

Overall, the patterns of their opinions regarding their educational preparation were similar to the Maryland and national U.S. surveys.^{20,23} One apparent difference is in the proportion of dental hygienists who reported training to palpate lymph nodes. This survey and the U.S. national survey are similar and both are about 20% more than those who reported this in Maryland.

Finally, and this is similar to the Maryland and the U.S. national surveys, the desire for more continuing education on oral cancer was almost unanimous among dental hygienists. Considering the important role of the dental hygienist in pre-

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venting and detecting oral cancer, and their recognition of their limited knowledge and skill, the almost universal desire for more education on this topic is timely and can readily be addressed by educators. These findings on dental hygienists' knowledge, opinions, and practices on oral and pharyngeal cancer suggest strongly that educational interventions for practitioners and dental hygiene students are necessary, and further, that dental hygienists want more education in this area.

Educators should respond enthusiastically to this powerful combination of a need for education and a desire for it. Current undergraduate curricula and continuing education for graduates can effectively address the gaps identified in these findings through a range of educational strategies. Dental hygiene professional associations also have a responsibility to facilitate continuing competence, and regulatory boards are required to both facilitate and monitor ongoing competence. Hands-on clinical demonstrations and workshops can fulfill both the individual's need for additional education and the association's goals for enhanced professionalism. The National Dental Hygiene Certification Board should also take immediate action to address these findings. Demonstration of knowledge regarding oral cancer risk and diagnostic factors, examination procedures, assessment of risk factors by taking appropriate health history information, and counselling strategies regarding tobacco and alcohol intervention should all be included in the national certification examination.

Additional research is needed to determine why dental hygienists do not provide an oral cancer examination when they know that it is recommended, and more critically, when they know that it is unethical to withhold the examination when it is recommended. Qualitative research using focus groups could help to reveal the underlying contributing factors. The difficult questions about why dental hygienists do not see oral cancer examination as a necessary service, and why they do not pursue its inclusion as an integral component of the care they provide each patient/client must be stated and investigated. Qualitative research using focus groups of Maryland dental hygienists has recently provided in-depth information about why oral cancer examinations are, or are not, provided in that state on a routine basis.³⁷ Dental hygienists in that study stated they need adequate time to provide these examinations and hands-on training is required.

CONCLUSION

Practitioners must have current knowledge of oral cancer risks, non-risks, and diagnostic procedures in order to assess patient health, provide oral cancer examinations with both visual and palpation astuteness, and provide assistance with risk factor reduction through tobacco cessation and patient education. Although this survey demonstrated unacceptable gaps in dental hygienist knowledge and practices regarding oral cancer, it also demonstrated their degree of understanding of their needs in this area and a willingness to undertake additional education to close the gaps. The authors caution, however, that the survey results are probably more positive, or better, than those of non-respondent dental hygienists. An over-reporting of practices and an under-representation of real practices in the target group are likely in this study.

Dental hygienists also share with all health care practitioners the responsibility for enhancing the public's knowledge of health and improving their health behaviours by using and

disseminating scientific findings. In order to do these two things, they must have correct knowledge. This process of science transfer requires effective health education and health promotion strategies for both health professionals and the public.³⁸

Oral cancer is the only known oral disease or condition that can and frequently does lead to death and it often leads to severe disfiguring. Dental hygienists have the opportunity and responsibility to contribute substantively to a reduction in the morbidity and mortality associated with these cancers.

Acknowledgements

The authors thank all the dental hygienists who responded to this survey. Their many stories of successes in early detection, as well as their personal losses, reaffirm the need for greater attention from health care providers and the public health system to prevent and control oral cancers.

The authors also thank the College of Dental Hygienists of British Columbia and the Nova Scotia Dental Hygienists Association for their assistance in providing names and addresses of active licensees at the time of the survey. Both organizations have been very helpful and enthusiastic in facilitating this research. Partial support for this study was provided by grants from the Canadian Dental Hygienists Association Endowment Fund (Dentistry Canada) and Dalhousie University Faculty of Graduate Studies.

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ABSTRACTS FROM THE AMERICAN ASSOCIATION FOR DENTAL RESEARCH

The American Association for Dental Research (AADR) held its 32nd annual meeting and exhibition on March 12-15, 2003, in San Antonio, Texas. Current dental research findings are presented at these meetings, which consist of individual oral and poster presentations as well as symposia and workshops. The abstracts are published in designated issues of the *Journal of Dental Research*. CDHA has been granted permission to re-print a selection of these abstracts in *Probe*.

ELDERLY

0842 DENTAL SCALING AND EDUCATION OF CARE-AIDES TO REDUCE GINGIVAL BLEEDING AMONG INSTITUTIONALIZED ELDERLY

A.A. ALTANI, C.C.L. WYATT, and M.I. MACENTEE, University of British Columbia, Vancouver, Canada

Objective: this randomized control trial tested the effectiveness of an educational program for care-aides combined with dental scaling of institutionalized elders on the gingival bleeding of the elders. **Methods:** the Gingival Bleeding Index (GBI) was calculated following an oral examination by a dental hygienist of 112 elderly residents of 14 long-term care facilities. Care-aides in one randomly selected set of seven facilities received instruction and continuous guidance on oral hygiene from a nurse-educator in each facility, while the care-aides in the other set received similar instruction from a dental hygienist visiting each facility on one occasion without involving a nurse-educator. The two sets were separated randomly again to produce a "treatment" group of residents who received a full dental scaling, and a "non-treatment" group who did not get their teeth scaled. **Results:** showed no significant difference in the mean GBI of the four groups at baseline, but gingival bleeding following dental scaling in the nurse-educator/treatment group (GBI=23) was significantly lower (paired t-test) than in the nurse-educator/non-treatment group (GBI=58; $p=0.002$), the hygienist/treatment group (GBI=47; $p=0.031$) or the hygienist/non-treatment group (GBI=76; $p=0.000$). **Conclusions:** are that the gingival health of institutionalized elders can benefit from dental scaling combined with an oral hygiene-related educational program offered to care-aides by a nurse-educator. Supported by BCHRF Institutional Program Grant #212 (97-2).

ELDERLY

0654 ORAL HEALTH INTERVENTION IN OLDER ADULTS

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As the population ages with more chronic diseases and retains teeth longer, innovative approaches to personal and professional oral care are needed. **Objective:** To compare the effectiveness of novel, consumer-directed, methods of oral health maintenance in a population of adults with chronic diseases. **Methods:** This research was part of a comprehensive randomized study of consumer-directed care in New York, West Virginia, and Ohio. From a total study population of 1786 Medicare recipients, a random sample of 200 received an oral examination at baseline and after 22 months. The examinations were completed using standard techniques and utilized NIDR protocols for identifying and reporting coronal and root caries, gingival bleeding, calculus, loss of attachment, and periodontal pocket depths. Maintenance techniques involved use of a health promotion nurse trained in preventive practices for common oral diseases and a monthly monetary voucher, supplied by Medicare, which could be used at subjects' discretion to support their personal oral care. Paired t-tests were used to compare findings at initial and final examinations. **Results:** Levels of caries and some periodontal indices in the two exams were similar, but pocket depths measured at four sites were significantly less ($p<0.05$) at the second exam. **Conclusion:** These results suggest that advanced periodontal disease (indicated by pocket depths), which has been implicated as an etiologic factor in some systemic diseases, may be improved by simple methods of consumer-directed oral care.

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CARIES

0837 A TWO-YEAR RCT OF MOUTHRINSES TO CONTROL CARIES AMONG INSTITUTIONALIZED ELDERLY

C.C.L. WYATT, and M.I. MACENTEE, University of British Columbia, Vancouver, Canada

Objective: The randomized controlled trial was conducted to determine the effectiveness of daily mouthrinses with 0.2% neutral sodium fluoride (NaF) or 0.12% chlorhexidine (CHX) to reduce the incidence of caries among elders in long-term care (LTC) facilities. **Methods:** Participants were recruited from 39 facilities and 116 of them with a mean age of 83 yrs were assigned randomly to a NaF ($n=39$), a CHX ($n=41$) or a Placebo (P) ($n=36$) group. They were instructed to use the mouthrinse daily, monitored regularly to determine compliance, and examined using NIDR criteria for caries at baseline and after one and two years. **Results:** The prevalence of caries and the dental status were similar in the groups at baseline and each group lost less than one tooth per person over the two years. The prevalence of caries increased in the CHX (73% to 85%) and P (75% to 81%) groups, but decreased in the NaF group (85% to 61%) during the two-year trial. This represents a 66% and 20% increase of caries prevalence in the CHX and P groups respectively, compared to a 9% decrease in the NaF group, over the two years. Moreover, the incidence of three or more carious lesions was significantly less in the NaF (15%) compared to the CHX (49%; $\text{Chi-sq} = 10.1$; $\text{df} = 1$; $p = 0.001$) or the P (42%; $\text{Chi-sq} = 6.4$; $\text{df} = 1$; $p = 0.01$) groups. **Conclusion:** A daily mouthrinse with 0.2% neutral NaF is more effective than a CHX or a placebo mouthrinse for controlling caries among disabled elders in LTC. Supported by BCHRF Institutional Program Grant #212 (97-2).

ORAL HYGIENE

0500 SUPHUR BY-PRODUCT: A POTENTIAL INDICATOR OF EARLY DENTAL-PLAQUE-INDUCED GINGIVAL DISEASE ACTIVITY

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Objective: The purpose of this study is to determine the relationship between volatile sulfide compounds and gingival health status, and to recognize if volatile sulfide compounds can detect early dental plaque-induced gingival disease. **Methods:** Using a 21-day experimental gingivitis model, 39 subjects between 19-62 years old with gingival health were enrolled. After baseline data collection and for three subsequent weeks, subjects refrained from brushing and flossing one randomly selected quadrant of the mandibular arch. At baseline, day 7, 14, and 21, gingival inflammation (GI), bleeding on probing (BOP), and sulfide levels (SUL) were collected using the Gingival Index of Loe and Silness and the Diamond Probe/Perio 2000 System. The Pearson correlation test determined the relationship between sulfide levels and gingival health status. The Wilcoxon test was used to compare the differences in GI, BOP, and SUL levels between the oral hygiene and non-oral hygiene sides. **Results:** The non-oral hygiene side data showed that sulfide levels relate significantly with the GI ($p<.001$) and BOP ($p<.001$) scores. **Conclusion:** SUL levels correlate positively to all periodontal parameters used in this study suggesting that volatile sulfide compounds can serve as a useful marker in detecting early clinical dental plaque-induced gingivitis. (Support provided by Diamond General Development Corporation and American Dental Hygienists' Association.)

1391 EFFICACY AND ACCEPTABILITY OF A NEW MANUAL TOOTHBRUSH

P.R. WARREN,¹ M.A. CUGINI,¹ M.C. THOMPSON,¹ J.G. QAQISH,² H.J. GALUSTIANS,² and N.C. SHARMA²

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The superior efficacy of the Oral-B CrossAction (CA) manual toothbrush has been well documented in laboratory and clinical studies. A new brush, CrossAction Vitalizer (CAV) was developed featuring special rubberized bristles to enhance gum massage. **Objective:** Two independent randomized, single-use cross over studies were conducted comparing CAV with CA and a leading toothbrush, Oral-B Advantage (AD). In addition, a separate independent consumer survey (n = 72) evaluated the acceptability of the new brush. **Methods:** In each study, after 23-25 hours of no oral hygiene, subjects received a baseline oral soft tissue examination. Disclosed plaque was scored using the Modified Navy Plaque Index and subjects were randomly assigned to a treatment sequence. In study 1, subjects (n = 53) received either CA or CAV toothbrush, while in study 2 subjects (n = 65) received either CAV or AD toothbrush. After a 1-minute timed brushing without instruction, hard and soft tissues were re-examined and post-brushing plaque scores obtained. Subjects returned to the test facility after a brief washout period and brushed with the alternate toothbrush as described. All clinical measurements were made by one examiner who was blinded to treatment group. **Results:** Each toothbrush was found to be safe and significantly reduced plaque levels after a single brushing, whole mouth, marginal and approximal areas ($p < 0.0001$). In each study, CAV removed significantly greater plaque from all areas than the compared toothbrushes as determined by ANOVA ($p < 0.001$). CAV was particularly effective at approximal areas - study 1: 90% vs 79% (CA); study 2: 84% vs 66% (AD). 79% of consumers surveyed liked CAV better than their last manual toothbrush used and 70% of consumers preferred CAV for its feeling of gum massage. **Conclusion:** CrossAction Vitalizer demonstrated superior plaque removal and is safe to oral tissues when compared to two advanced design toothbrushes. Sponsored by Oral-B Laboratories, Boston MA.

0532 IMPROVED CAL AND PPD WITH ENDOSCOPE-AIDED SCALING AND ROOT PLANING

R.V. STAMBAUGH, and G. MYERS, Private Practice of Periodontics and Implants, Bellingham, WA, USA

Objectives: To evaluate the clinical response to S\RP aided by an endoscope over that of traditional S\RP. **Methods:** Eight hundred and sixty four periodontal pockets were treated with traditional, non-endoscope aided S\RP and provided periodontal maintenance procedures (PMP) every three months for one year. These sites received further S\RP at one year with the aid of an endoscope designed specifically for this purpose. Six hundred and twenty six sites > 5mm remained in the patient pool at the end of the first through third year. The same clinicians provided all therapy. The sites were provided traditional PMP for three additional years and data collected at 90-day intervals. No antibiotics or other drugs were administered to facilitate healing. **Results:** 1. Significantly additional reduction in PPD (2.25mm mean over traditional S\RP in all sites). 2. Significant gain in CAL (1.86mm all sites). 3. Improvement in CAL and PPD may continue up to 12 months. 4. Results maintained for over 36 months with three-month PMP. 5. Furcations, maxillary bicuspid and distals of second molars did not generally respond as well. 6. Scaling and root planing with the aid of a dental endoscope requires significantly more time than traditional scaling and root planing. These observations are significant to $p < .0001$. **Conclusions:** Endoscope aided S\RP results in significant improvement in CAL and PPD over traditional S\RP.

0531 EFFECT OF ARESTIN IN MOLARS AND FURCATIONS IN PERIODONTITIS PATIENTS WHO SMOKE

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Objective: Treatment of molars and furcations in chronic periodontitis patients who smoke is considered difficult. The objective of this analysis is to evaluate the efficacy of minocycline microspheres (Arestin) and scaling and root planing (SRP) in this population. **Methods:** Ninety patients who smoke were randomized to SRP alone and 90 to Arestin + SRP in a single blind study (Williams, et al 2001). The primary endpoint was pocket depth (PD) reduction. Univariate and multivariate site analyses were performed. All patients received full mouth SRP, unrestricted to time, at baseline. Arestin was administered to all periodontal pockets ≤ 5 mm at baseline, 3 and 6 months and PD was recorded at 1, 3 and 9 months. **Results:** For Arestin + SRP, molars demonstrated significantly greater differences in PD reduction at 1, 3 and 9 months ($p < 0.0001$). Similarly for furcations, Arestin + SRP demonstrated significantly greater PD reduction at 3 ($p < 0.05$) and 9 months ($p < 0.01$). Significantly more pockets in molars decreased by ≤ 2 mm and ≤ 3 mm at months 1, 3 and 9 in the Arestin + SRP group compared to the SRP alone group. In addition, more furcations decreased by ≤ 2 mm and ≤ 3 mm in the Arestin + SRP group at month 9 ($p < 0.05$) than in the SRP alone group. The difference was significant ($p < 0.0001$) in molars that converted to < 5 mm at 1, 3 and 9 months in the Arestin + SRP group compared to SRP alone. At 3 and 9 months significantly more furcations in Arestin + SRP group were converted to < 5 mm, 55% vs 40% and 57% vs 32% respectively. **Conclusion:** Arestin as adjunctive therapy to SRP compared to SRP alone, is significantly more effective in reducing PD in molars and furcations sites, and converting individual sites to less than 5mm, in patients who smoke. Supported by a grant from OraPharma, Inc.

0527 COMPARISON OF 3 SYSTEMIC ANTIMICROBIAL PERIODONTAL THERAPIES. I. CLINICAL

P. PFLUG, A.D. HAJFAJEE, G. TORRESYAP, D.M. GUERRERO, and S.S. SOCRANSKY, The Forsyth Institute, Boston, MA, USA

Objective: To compare the clinical and microbial changes occurring in chronic periodontitis subjects receiving SRP alone or with systemically administered metronidazole, azithromycin or low dose doxycycline (Periostat); agents with different modes of action, dosage and duration. **Methods:** 25 chronic periodontitis subjects were measured at baseline for plaque, gingivitis, BOP, suppuration, pocket depth (PD) and attachment level (AL) at 6 sites per tooth. Subjects were randomly assigned to 4 groups receiving SRP alone (N=6) or combined with 500 mg azithromycin per day for 3 days (AZ, N=6), 250 mg metronidazole tid for 14 days (MET, N=5) or 20 mg doxycycline bid for 3 months (LDD, N=8). The significance of changes in clinical parameters within groups over time was sought using the Wilcoxon test and among groups using ANCOVA. **Results:** Subjects in all groups showed significant improvement in mean clinical parameters at 3 months. Mean full mouth reduction ($\pm$ SEM) in PD was 0.32 ± 0.07 , 0.42 ± 0.18 , 0.34 ± 0.08 , 0.42 ± 0.17 for AZ, MET, LDD and SRP respectively. Corresponding reductions for AL were 0.06 ± 0.07 , 0.36 ± 0.20 , 0.23 ± 0.06 , 0.22 ± 0.15 mm. Differences among groups were not statistically significant at baseline or at 3 months. When sites were subset according to baseline PD of < 4 , 4-6 and > 6 mm, the greatest reduction in mean PD and gain in mean AL at sites with baseline PD > 6 mm was in subjects receiving adjunctive MET. **Conclusions:** In this ongoing study, all treatment groups showed clinical improvement 3 months post-therapy, although there were few significant differences among the 4 treatment groups. This may be due to the small number of subjects recruited to date. Sites with initially deeper PD showed a better clinical response in subjects receiving adjunctive metronidazole. Supported by NIDCR grants DE 13232, DE 12108

0843 STABILITY OF ORAL HEALTH STATUS IN A LONG-TERM-CARE POPULATION

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Objective: to investigate patterns and predictors of dental service utilization over time among an institutionalized elderly population receiving comprehensive care on a regular basis. **Methods:** Data was drawn from 868 dental records of dentate nursing home residents who had received comprehensive dental services over a minimum of 24-months. The number, type and cost of services were analyzed for each treatment period bounded by periodic examinations. Characteristics of long-term care facility residents (presenting dental condition, age, sex, functional status, and payer source) and facility characteristics (ownership type and size) were utilized as explanatory variables. Stability status (stable = only diagnostic and preventive services needed) was established for each treatment period. Stability status was assigned at the person level based on treatment needs at the first periodic examination following completion of the initial treatment plan. Repeated measures analysis was used to identify predictors of stability and dental utilization over time. **Results:** Female sex was positively associated with stability ($p < 0.01$). More services initially required were negatively associated with stability ($p < .0001$). Age was positively predictive of diagnostic service utilization ($p = 0.04$) and restorative costs ($p = 0.04$). Number of teeth at first visit was positively associated with restorative services and costs ($p < .0001$); negatively associated with prosthodontic services and costs ($p < .0001$). Number of services initially required was negatively associated with diagnostic costs ($p < 0.01$) and positively associated with prosthodontic services and costs ($p < .0001$). Facility size was positively predictive of diagnostic and restorative services and costs ($p = < .001$). Ownership types of non-profit and non-religious were positively associated with diagnostic services and costs ($p < 0.01$), as well as prosthodontic services ($p < 0.01$). Lower functional dependency was positively associated with prosthodontic services and costs ($p < 0.01$). **Conclusion:** Number of teeth present and services initially required provide indicators of future needs. Facility factors (size, ownership type) positively influence utilization. Resident function influences prosthodontic service.

0841 MEDICATION TAKEN BY OH:SALSA SUBJECTS AND RELATED ORAL SIDE-EFFECTS

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Polypharmacy and oral side effects (OSE) from medications often occur in persons over the age of 65, but data from large community-based samples are limited. **Objective:** This study reports the medications taken by 1,163 participants of the Oral Health: San Antonio Longitudinal Study of Aging. **Methods:** Subjects (mean age = 60.2, sd = 11.3, range = 32-81) completed a medication assessment at their home and at a dental clinic. Variables included number of different prescription and OTC medications taken within the previous 2 weeks, frequency of potential OSE, and age. Medications (except alternative substances, vitamins, and minerals) were checked in three drug references, and all potential OSE were classified into 16 major categories. Data were analyzed using descriptive statistics and Spearman rank order correlation. **Results:** The mean number of medications taken per subject was 2.7 (range: 0 to 14). The mean number of medications disclosed during the home-based assessment (2.2) was higher than the number disclosed during the dental clinic assessment (1.8). The Spearman rank order correlation between age and number of medications was 0.282 ($p < 0.001$). A total of 508 different medications having potential OSE were disclosed. The most frequent potential OSE were dry mouth in 664 (57%) subjects, bleeding in 456 (39%), alteration in taste in 389 (33%), and stomatitis in 331 (28%). The distribution of subjects with respect to number of potential OSE was: none 20%; 1 to 2, 24%; 3 to 4, 26%; 5 to 6, 14%; and 7 or more, 16%. **Conclusions:** Eighty percent of community-dwelling persons in this sample were at risk for at least one OSE, and many are at risk for multiple OSE. Practitioners of geriatric dentistry face a heavy challenge to keep track of their patients' exposure to potential OSE. Supported by NIH/NIDCR P50DE10756 & CAPES/Brazil BEX 0807/99

HIV/AIDS

0167 DENTAL HEALTH HISTORIES IN HIV-INFECTED PATIENTS AT INITIAL PRESENTATION FOR DENTAL CARE

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Objectives: To: 1) identify when and why HIV-infected individuals seek dental care and 2) determine the frequency of health care provider initiated visit for dental care. **Method:** Self-report dental histories were drawn from 1,303 patient records collected over a seven-year period at UAB's HIV-dedicated dental clinic. History taking was conducted as part of a patient's initial visit for dental care. Questions included chief dental complaint, date of HIV diagnosis, method of gaining awareness of the dental clinic, date and reason for any preceding dental care, current appetite and any difficulty eating. **Results:** N = 919 (70.5%). With pain being the most commonly reported problem, an emergent need for dental care accounted for 358 (39%) of first time visits. The majority, 757 (82.4%) reported being HIV-infected greater than one year. Referral by a health care worker accounted for 492 (53.5%) visits. While pain or an emergent problem accounted for a preceding dental visit in 242 (26.3%) patients, 700 (76.2%) had not seen a dentist in more than a year. A good or excellent appetite was reported by 616 (67%). Difficulty eating was reported by 338 (36.8%). **Conclusions:** Pain was a major reason for seeking care. Many HIV-infected patients were not enrolled in a program of routine dental care. While many HIV-infected patients presented for dental care as the result of a health care provider referral many did not report their health care provider as a referral source. Future studies need to be conducted to identify the status of oral health in persons with HIV and barriers to dental care. The referral practices of health care providers may have a significant effect upon a patient's willingness to seek dental care. The awareness of the need for and availability of dental care for HIV-infected patients needs to be expanded and integrated into their care.

HIV/AIDS

0653 OLDER ADULTS AND HIV/AIDS: WHAT DO DENTAL HYGIENISTS KNOW AND PRACTICE?

JANET A. YELLOWITZ, CHRISTINE J. WISNOM, MARK D. MACEK, CECILIA ASHTON

Although dentists' knowledge, opinions and practices (KOP) of HIV/AIDS has been well documented, limited efforts have focused on dental hygienists' KOP of HIV in older adults. **Objective:** The purpose of this pilot project was to assess the knowledge and practices of dental hygienists (RDH) regarding HIV/AIDS in patients 50+ years of age. **Methods:** 400 RDHs were randomly selected from a list purchased from the MD. State Board of Dental Examiners. Each RDH was mailed a 16-item pre-tested questionnaire, cover letter and a stamped return envelope in September 2001. A reminder postcard was mailed 3 weeks later, followed by a second complete mailing 3 weeks following the postcard. **Results:** The response rate was 81%. The RDHs were primarily female, had an Associates degree and were employed in a general dental practice. Almost all (95%) associated Candidiasis with HIV, but only 75% associated HIV with hairy leukoplakia. The majority of RDHs reported treating only a few patients with HIV/AIDS during the previous year. A very small group of RDHs (15%) knew that 10% of AIDS cases occur in the 50+ population. A statistically significant number of RDHs reported never/rarely detecting HIV in their patients ($p = 0.05$), or never/rarely discussing HIV with their patients < 30 years or + years ($p = 0.05$). More than three quarters of RDHs reported not having sufficient information on HIV in 50+ age group. Although familiar with most oral signs of HIV/AIDS, dental hygienists were less familiar with the pathognomonic signs of HIV/AIDS disease and reported not to have sufficient information on this problem. **Conclusion:** Based on findings of this pilot project, RDHs are at risk for not detecting HIV/AIDS in their patients, specifically in those 50+ years.

2002 Oral-B/CDHA Dental Hygiene Undergraduate Baccalaureate Student Scholarship

Sherry Priebe, a registered dental hygienist for 25 years, is an independent contractor of clinical dental hygiene services. After completing the University of Alberta Dental Hygiene diploma, she returned to Kelowna, B.C., and led the National Dental Hygiene Awareness Campaign as well as the Kelowna and Area Dental Hygiene Society. Sherry has volunteered for oral health missions to Cameroon and Ecuador and has presented dental hygiene promotional seminars with clinical demonstrations in China and Mongolia. Being on the program advisory committee for the Dental Assisting program at the Okanagan University College in Kelowna, B.C. has allowed Sherry to talk about dental hygiene issues in a unique setting.

Sherry is graduating with a Bachelor of Dental Science degree from the University of British Columbia in May 2003. Oral health promotion both in Canada and internationally is Sherry's focus as she pursues her education to advance her professional career.

The Student Scholarship Awards Committee commends all of this year's applicants for their dedication to their education and looks forward to welcoming them all as colleagues upon graduation.

The CDHA would like to extend special thanks to our partner, Oral-B, for its active participation in our efforts to support our dental hygiene undergraduate baccalaureate students through this scholarship.



Important Safety Information on Diathermy Therapy

Patients with implanted metallic (electrical) leads risk serious injury or death from diathermy treatments. Diathermy therapy may also damage some implanted systems. Patients are at risk even if the leads are not connected to an implanted device or if the device is off. This information is not likely relevant for many dental hygienists. However, it may be relevant for those providing treatments for TMJ or swelling and pain after surgery. For the small number of individuals who may use this treatment, please visit the Health Canada web site for further information: www.hc-sc.gc.ca/hpb-dgps/therapeut/htmleng/adviss_tpd_bgtd_e.html.

HORMONE REPLACEMENT THERAPY

1444 HORMONE REPLACEMENT THERAPY AND ALVEOLAR BONE HEIGHT

M.K. JEFFCOAT, S.J. HAIGH, N.C. GEURS, and M.S. REDDY, University of Alabama at Birmingham, USA

Objective: The objective of this cross-sectional study was to determine if treatment with daily conjugated estrogen plus medroxyprogesterone acetate was associated with better oral health as evidenced by (1) higher tooth count and (2) less prevalence and severity of periodontitis. **Methods:** The Heart Estrogen-Progestin Replacement Study (HERS) provided a unique opportunity to measure the impact of hormone therapy on oral health in a large, randomized, controlled, blinded trial among older postmenopausal women. The HERS trial, a multi-center study of 2763 postmenopausal women with coronary artery disease randomized to Premarin 0.625 mg/d and Cycrin 2.5 mg/d or to identical placebo, was designed to test the hypothesis that women receiving hormone therapy have a lower rate of coronary events than women taking placebo. Oral health was assessed by blinded examiners in 100 HERS participants at the end of the five year double blind placebo controlled trial and oral health scores in hormone treated and placebo treated women were compared. Oral health examinations included tooth count, probing depths, probing attachment levels, gingival index, plaque index, and measurements of alveolar bone loss. **Results:** At the end of the five-year treatment period for the parent study, there were no significant differences in plaque, gingival index, smoking, or tooth count. There was greater loss of bone height in the placebo treated group compared to the HRT group (placebo treated group 3.42 ± 0.11 mm, HRT group 3.06 ± 0.26 mm, $p < 0.05$ ANOVA). 27.78% of placebo treated patients exhibited bone loss of less than three millimeters while 40.91% of HRT patients exhibited bone loss of less than three millimeters (odds ratio: 0.56 favoring HRT). **Conclusion:** This cross-sectional study indicates that patients taking five years of HRT may have less alveolar bone loss than placebo treated patients. These results should be interpreted in light of the risk-benefit ratio for HRT. Supported by Wyeth-Ayerst.

DIABETES

1445 LOW-DOSE DOXYCYCLINE TREATMENT REDUCES GLYCOSYLATED HEMOGLOBIN IN PATIENTS WITH TYPE 2 DIABETES: A RANDOMIZED CONTROLLED TRIAL

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Objectives: Glycosylated hemoglobin (HbA1c), is related to diabetes complications. Studies suggest that doxycycline may help reduce HbA1c. It was the goal of this study to test whether a non-antimicrobial doxycycline regimen is effective in reducing HbA1c. **Methods:** 45 patients with long-standing type 2 diabetes and untreated periodontitis were randomized to receive either low-dose doxycycline (LDD), antimicrobial-dose doxycycline (ADD), or placebo in addition to scaling and root planing. All were taking oral medications or insulin. HbA1c and clinical periodontal measures were assessed at baseline and three months. **Results:** At three months, levels of HbA1c were significantly lower in the LDD group than either placebo ($p = .004$) or ADD ($p = .03$). Mean HbA1c levels in the LDD group were reduced from $7.9 \pm 1.9\%$ ($\pm$ SD), to $6.3 \pm 1.1\%$. There was no change in HbA1c in the ADD ($7.6 \pm 2.0\%$ to $7.8 \pm 2.1\%$) or placebo ($8.2 \pm 2.0\%$ to $8.3 \pm 2.6\%$) groups. Mean serum glucose levels were not significantly reduced during the study in any of the treatment groups. At 3 months periodontal parameters were improved but were not significantly different between groups. **Conclusion:** These results suggest that twice daily low-dose doxycycline decreases HbA1c in patients who are taking normally prescribed hypoglycemic agents. Columbia University Office of Clinical Trials Pilot Award(SE), and K23 DE 00449(SE).

improve this is a worthy objective for individuals as well as groups.

Jonathan Swift said that "there is nothing in this world constant, but inconstancy." Since change is a fact of life, perhaps truer today than ever before, we have to become adaptable. In this issue of *Probe*, you will read about new scientific advances that will challenge how you practise and how you make decisions. We are constantly being exhorted to make evidence-based decisions, yet even the evidence is changing. So in this inconstant world, it is imperative that we as professionals and professional organizations keep current with credible literature and adapt to changes based on evidence, rather than trends or pressure. New conditions will require an "adaptable adventurer."

This "adaptable adventurer" must remember, however, that all good ideas are not doable and all doable ideas are not good. Dream dreams that are achievable and know that hard work will be required to fulfill them. Take one step at a time along this worthy journey toward excellence. Remember to applaud loudly all successes, however great or small; as these new conditions emerge, they will create new men and women who will in turn work toward new conditions. And so the cycle will continue.

I challenge each of you to read the *Access Angst* paper on-line in the *Members Only* section of our web site (www.cdha.ca). For those who wish a hard copy of the report, just call the CDHA office toll free at 1-800-267-5235 with your request. Look at the issues. Read the recommendations. As I said before, a paper cannot solve the problems regarding access to oral health services, but people can. Let's work together to create new oral health service conditions in Canada because the return on our investment will be the improved oral and general health of Canadians.

Karen Wolf can be reached at <president@cdha.ca>. 

"LE MEILLEUR DES MONDES" (suite de la page 99)

nouvelles conditions pour améliorer cette situation constitue un objectif digne de mérite pour les personnes aussi bien que pour les groupes.

Jonathan Swift a écrit : « Il n'y a dans ce monde rien de constant, si ce n'est l'inconstance ». Puisque le changement est une réalité, ce qui est peut-être encore plus vrai aujourd'hui que jamais auparavant, nous devons devenir adaptables. Dans ce numéro de *Probe* vous pourrez lire des exposés sur des avancées technologiques qui remettront en cause votre pratique et la façon de prendre vos décisions. Nous sommes constamment invités à prendre des décisions sur la foi de données probantes, mais même la preuve est en évolution. Alors, dans ce monde inconstant, il est impératif, en tant que professionnels et organismes professionnels, que

J'enjoins chacun et chacune de vous de lire le document Access Angst en ligne dans la section Réservée aux membres de notre site web (www.cdha.ca).

nous restions au courant de la documentation crédible et que nous nous adaptions aux changements fondés, plutôt qu'aux tendances ou aux pressions. Les nouvelles conditions vont exiger de devenir un « aventurier capable d'adaptation ».

Cet « aventurier adaptable » doit toutefois se rappeler que toutes les bonnes idées ne sont pas faisables et que toutes les idées faisables ne sont pas bonnes. Rêvez des rêves qui sont réalisables et sachez qu'il faudra un travail dur pour les réaliser. Faites un pas à la fois dans cette quête valable de l'excellence. N'oubliez pas d'applaudir chaudement toutes les réussites, grandes et petites; au fur et à mesure que ces nouvelles conditions apparaissent, elles créeront de nouveaux hommes et de nouvelles femmes qui travailleront à leur tour à créer de nouvelles conditions. Et c'est ainsi que le cycle se poursuivra.

J'enjoins chacun et chacune de vous de lire le document *Access Angst* en ligne dans la section *Réservée aux membres* de notre site web (www.cdha.ca). Pour ceux et celles qui désirent une copie papier du rapport, il vous suffira d'appeler le bureau de l'ACHD sans frais au numéro 1-800-267-5235 et d'en faire la demande. Examinez les enjeux. Lisez les recommandations. Comme je l'ai déjà dit, un document ne peut seul résoudre les problèmes d'accès aux services de santé buccale, mais les personnes le peuvent. Travaillons ensemble à créer de nouvelles conditions de services de santé buccale au Canada parce que le rendement de notre investissement se traduira par une amélioration de la santé buccale et de l'état de santé général des Canadiens.

On peut joindre Karen Wolf à l'adresse <president@cdha.ca>. 



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Baccalaureate as entry to practice

Education of dental hygienists must constantly change to keep pace with changes in the health care needs of Canadians. A greatly expanded knowledge base, an ageing population, advanced technology, and increased client populations with compromising and degenerative health concerns have added essential content to dental hygiene diploma curricula over the last few years and they are overloaded. New study areas include care of implant clients and exceptional needs individuals; the ageing population; tobacco use and counselling; pain, fear, and anxiety control; the impact of periodontitis on low-birth-weight babies and systemic disease—to mention just a few. The need to expand current education programs to the baccalaureate degree is evident. The depth and breadth of education offered in a degree program will prepare graduates to meet the current and future health care needs of Canadians.

Dental hygiene workplaces

Many of our members do not work with other dental hygienists and as a result, some experience professional isolation. We are working to better understand dental hygiene workplaces and to provide you with feedback regarding working conditions and salary. Human resources in the oral health sector are being studied in a multi-year project in collaboration with four other oral health care provider groups, Human Resources Development Canada, and Health Canada.

Evidence-based research

In today's knowledge-based society, people look for accountability for actions and evidence to support actions taken. Evidence-based research has two focuses for CDHA. First, it enables national, evidence-based position statements related to the dental hygiene profession and a strong research base to support the profession of dental hygiene. Second, it provides knowledge and evidence to support the decision-making practices for the association. This involves benchmarking for best practices with other professional associations, auditing our practices, and surveying our members.

Mentorship of students and volunteers

CDHA exists because of the volunteer leadership of dental hygienists nation-wide. In our fast-paced environment, finding time to devote to the profession is difficult but much appreciated and the time is a good investment. Mentorship of new volunteers, development of a sense of community in students and of a passion for leadership in the profession are areas of endeavour for CDHA.

Reimbursement of dental hygienists

Dental hygienists' services may be delivered in a number of settings including a dentist's office, dental hygienist's office, mobile practice, or residential care home. In some provinces, dental hygienists do not work under the supervision of a dentist but some insurance policies will pay the claim only if the work has been "performed under the supervision of a dentist." Many companies interpret this to mean the work has been "performed by a dental hygienist in the employ of a dentist," thus justifying the denial of payment.

Scaling module

Dentistry proposed a Preventive Dentistry Module that could be taught to dental assistants in a few provinces. Dental hygienists are concerned that this module separates out one

component (scaling) of the dental hygiene process of care. Supra gingival scaling does not support scientific periodontal outcomes and dental professionals have seen the problems that often present when patients receive cleanings only "above the gum line." Dental hygiene education involves study in the social, biomedical, and oral health sciences and includes over 900 hours of clinical practice. "Fast tracking" dental assistants as alternatives to fully educated dental hygienists ignores the potential risk of harm to the public.

Self-regulation

A self-regulated professional is expected to take responsibility for ensuring competent, safe service. The profession of dental hygiene should be able to make its own decisions regarding education and scope of practice. In a self-regulating province, the dental hygienist can contact the College of Dental Hygienists and determine the appropriate standards of care. While most dental hygienists are self-regulating, only five provincial jurisdictions have that status. That means dental hygienists do not control their own profession in five provinces. Nationally, this means when issues such as labour mobility are discussed, only five dental hygiene voices are at the table.

Shortage

Organized dentistry has paid a great deal of attention to the supposed shortage of dental hygienists. Dentistry raised this issue to support progress on the scaling module as well as opposition to the recommendation that the baccalaureate degree be an entry-to-practice requirement. Health Canada's Health Manpower Inventory in 1976 estimated there were 211 dental hygienists in Canada in 1965; by 2001, the number was 13,834.² The ratio of dental hygienists to population was 1:16,637 in 1968 and 1:2,240 in 2001.³ With no corresponding increase in the number of dentists, the ratio of active dental hygienists to active dentists increased from 1:5 in 1977 to 1:1 in 2001.⁴ With a low attrition rate and low inactive pool, the dental hygiene workforce is very stable with one-half of its members having remained in the same job for 10 years.⁵

1. Canadian Dental Hygienists Association: The management of dental hygiene care, guiding principles. CDHA Position Statement. Ottawa, ON: CDHA, 1992
2. Canada. Health and Welfare Canada: Canada health manpower inventory 1976. The practice of dental hygiene in Canada: description, guidelines and recommendations. Part One. Ottawa: Health and Welfare Canada; 1988. In: Johnson, P.M.: Dental hygiene practice in Canada 2001. Report No. 3. Findings. Ottawa: CDHA, p. 380, 2002
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4. Johnson, P.M.: Op cit, p. 380
5. Ibid, p. 393

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une santé compromettante et dégénérative ont ajouté un contenu essentiel aux programmes de diplôme en hygiène dentaire ces toutes dernières années, et ils sont surchargés. Les nouveaux domaines d'étude comprennent — pour n'en mentionner que quelques-uns — les soins pour les clients qui ont reçu des implants et les personnes ayant des besoins exceptionnels ; la population vieillissante ; l'usage du tabac et le counselling ; le contrôle de la douleur, de la peur et de l'anxiété ; les répercussions de la parodontie sur les enfants de faible poids à la naissance et la maladie systémique. Il faut évidemment élargir les programmes d'enseignement actuels au niveau du baccalauréat. L'étendue et l'ampleur de l'enseignement offert dans un programme de diplôme prépareront les diplômés à répondre aux besoins actuels et futurs de soins de santé des Canadiens.

Lieux de travail des hygiénistes dentaires

Plusieurs de nos membres ne travaillent pas avec d'autres hygiénistes dentaires et, en conséquence, certains éprouvent des sentiments d'isolement professionnel. Nous nous efforçons de comprendre les lieux de travail des hygiénistes dentaires et à vous communiquer votre réaction concernant les conditions de travail et les salaires. On étudiera les ressources humaines dans le secteur de la santé buccale dans le cadre d'un projet réparti sur plusieurs années, en collaboration avec quatre autres groupes de dispensateurs de soins de santé buccale. Développement des ressources humaines Canada et Santé Canada.

Recherche fondée sur des données probantes

Dans la société d'aujourd'hui fondée sur le savoir, on recherche la responsabilité concernant les actions et les preuves étayant les actions prises. Pour l'ACHD, la recherche fondée sur des données probantes met l'accent sur deux points. D'abord, elle permet des énoncés de position nationaux, basés sur des preuves, en rapport avec la profession de l'hygiène dentaire et une base de recherche solide pour soutenir la profession de l'hygiène dentaire. En second lieu, elle offre des connaissances et des preuves pour appuyer les pratiques de prise de décisions pour l'association. Ce qui demande l'analyse comparative des pratiques exemplaires avec d'autres associations professionnelles, la vérification de nos pratiques et des sondages auprès de nos membres.

Mentorat auprès des étudiants et des bénévoles

L'ACHD existe en raison du leadership des bénévoles des hygiénistes dentaires à la grandeur du pays. Dans notre environnement au rythme rapide, trouver du temps à consacrer à la profession s'avère difficile mais très apprécié, et le temps est un bon investissement. Le mentorat auprès de nouveaux bénévoles, le développement d'un sens communautaire chez les étudiants et d'une passion pour le leadership dans la profession sont des domaines d'activités à l'ACHD.

Remboursement des services des hygiénistes dentaires

Les services des hygiénistes dentaires peuvent être dispensés dans un certain nombre de milieux, dont un cabinet de dentiste, un cabinet d'hygiéniste dentaire, une pratique mobile ou un foyer de soins résidentiel. Dans certaines provinces, les hygiénistes dentaires ne travaillent pas sous supervision d'un dentiste, mais certaines polices d'assurance ne paieront la réclamation que si le travail a été « effectué sous la supervision d'un dentiste ». Plusieurs compagnies interprètent cette clause comme signifiant que le travail a été « effectué par un/e hygiéniste dentaire à l'emploi d'un dentiste », justifiant ainsi le refus de paiement.

Module de détartrage

La profession de dentisterie a proposé un module de dentisterie préventive qui pourrait être enseigné aux assistant(e)s dentaires dans certaines provinces. Les hygiénistes dentaires s'inquiètent de ce que ce module sépare une des composantes (le détartrage) du processus de soins d'hygiène dentaire. Le détartrage supra-gingival ne s'appuie pas sur des résultats parodontiques scientifiques et les dentistes ont vu les problèmes qui se présentent souvent lorsque les patients reçoivent des nettoyages seulement « au-dessus de la limite gingivale ». L'enseignement de l'hygiène dentaire fait appel à des études touchant les sciences sociales, biomédicales, comme celles de la santé buccale; et elles comprennent plus de 900 heures de pratique clinique. La « formation accélérée » des assistant(e)s dentaires comme solution de remplacement des hygiénistes dentaires complètement formées ne tient pas compte du risque possible de préjudice au public.

Auto-réglementation

On s'attend d'un professionnel auto-réglementé qu'il assume la responsabilité d'assurer un service compétent et sécuritaire. La profession de l'hygiène dentaire devrait pouvoir prendre ses propres décisions concernant l'éducation et la portée de la pratique. Dans une province où il y a une auto-réglementation, l'hygiéniste dentaire peut communiquer avec l'Ordre des hygiénistes dentaires et déterminer les normes de soins appropriées. Même si la plupart des hygiénistes dentaires sont auto-réglementés, seules cinq instances provinciales ont ce statut. De sorte que les hygiénistes dentaires n'ont pas le contrôle de leur propre profession dans cinq autres provinces. Au niveau national, cela signifie que lorsque des questions telles que la mobilité de la main-d'œuvre sont discutées, seulement cinq porte-parole de l'hygiène dentaire sont entendus.

Pénurie

Les organisations de dentisterie ont porté beaucoup d'attention à la présumée pénurie d'hygiénistes dentaires. Elle ont soulevé cette question pour appuyer le progrès dans le module de détartrage ainsi que l'opposition à la recommandation selon laquelle le diplôme de baccalauréat soit une exigence d'admission à la pratique. L'inventaire de l'effectif des soins de santé, dressé par Santé Canada en 1976, estimait qu'il y avait 211 hygiénistes dentaires au Canada, en 1965 ; en 2001, le nombre était de 13 834². La proportion des hygiénistes dentaires par rapport à la population était de 1:16 637 en 1968 et de 1:2 240 en 2001³. Aucune augmentation correspondante du nombre des dentistes n'étant constatée, le rapport des hygiénistes dentaires en exercice, comparativement à celui des dentistes en activité, a augmenté de 1:5, en 1977, à 1:1, en 2001⁴. Avec un faible taux d'attrition et un petit bassin inactif, l'effectif de l'hygiène dentaire est très stable, la moitié de ses membres étant restés dans le même emploi pendant 10 ans⁵.

1. Canadian Dental Hygienists Association: The management of dental hygiene care, guiding principles. CDHA Position Statement. Ottawa, ON: CDHA, 1992
2. Canada. Health and Welfare Canada: Canada health manpower inventory 1976. The practice of dental hygiene in Canada: description, guidelines and recommendations. Part One. Ottawa: Health and Welfare Canada; 1988. In: Johnson, P.M.: Dental hygiene practice in Canada 2001. Report No. 3. Findings. Ottawa: CDHA, p. 380, 2002
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4. Johnson, P.M.: Op cit, p. 380
5. Ibid, p. 393

VITAL TOOTH WHITENING: A 2000+ REVIEW OF ITS EVOLUTION IN ACTIVE AGENT, TECHNIQUE, AND EFFECTS

BY MARILYN GOULDING, RDH, BSc, MOS

ABSTRACT

Vital tooth whitening has been a controversial issue since its introduction to the dental community in 1989. Since that time, a white smile has become the most popular and achievable elective pursuit in the health care field. However, dental hygienists and other dental professionals have been frustrated in acquiring sound scientific data on the safety and efficacy of this new treatment. Thus the purpose of this paper is to review the most recent studies, on both tray and strip technology, on the delivery of peroxide-based vital tooth whitening systems. It includes historical data on the integral issues of colour measurement technology and the active ingredient of hydrogen peroxide. The review was conducted by searching the literature for comparison studies on tray and trayless systems that were published between 2000 and 2002. Historical and summary studies prior to 2000 were included for background purposes. The review concludes that bleaching with H_2O_2 is safe and effective, with the newly available trayless technology providing a convenient alternative to the tray delivery systems.

INTRODUCTION

The first publication on the esthetic practice of tooth whitening appeared in the literature over a century ago in *Dental Cosmos*, an early periodical.^{1,2} One hundred years later, Haywood and Heymann³ re-introduced the practice, ushering in a new trend in the emerging specialty of esthetic dentistry. The market in the United States is now reported as worth \$500 million;⁴ the comparable figure for Canada is \$55 million.

Cosmetic enhancement has become commonplace in the past 20 years. Esthetic services are no longer the enclave of the privileged and Canadians have steadily increased their consumption of these services: plastic surgery, ocular laser surgery, electrolysis, hair transplants, even acrylic nails. The baby boomers are demanding continued health, retention of youth, and access to the medical technology their generation has spawned. As a result, dentistry has expanded in the quasi-elective fields of orthodontics, prosthetics, and cosmetic dentistry to encompass a wide range of choices in treatment, materials, and cost.

Dental hygiene thinking has had to adapt to agree that there is an acceptable intersection on the health/cosmetic continuum and that dental hygienists, as educators and consultants,

must make the connection for their dental clients. If self-esteem is inherent to the quality of life and part of a healthy psyche, then counselling on esthetic choices clearly falls within the parameters of dental hygiene care. Thus dental hygienists must inform themselves on the ever-increasing phenomenon of vital tooth whitening.

Due to the intense focus on tooth whitening and the development and proliferation of products, vital bleaching may be achieved through a various processes: professional/in-office, professional/home-use, and self-selected/over-the-counter formulations. A recent trade publication described at least 16 different manufacturers of the home-use, tray-based systems and identified this method as the most popular approach.⁵

The products available have a variety of concentrations and other features such as flavouring or desensitizing agents. A search of the early literature turned up few good study designs with lack of controls, non-randomization, non-comparable agents, low subject panels, subjective measures, and short duration inherent throughout.

The objective of this paper is to review the literature to examine the changes in delivery technique occurring after 2000; explore the evidence supporting the new rationale for reduced time exposure and concentration of the active agent, hydrogen peroxide; review the new information on its safety intra-orally; and finally, identify and quantify side effects.

METHODS

Given the overwhelmingly popular use of these self-directed products and research evolving to include more elegant designs and more reliable measures, the literature search was conducted as follows. The search term was "tooth bleaching" (a MeSH indexing term), narrowed by "English language," "dental journals," "humans only," and the dates "2000-2002." Within this time frame, there are a limited number of comparison studies on the tray systems with the bulk of work focused on the new "trayless" methodology.

The same search parameters were tried for the search term "hydrogen peroxide" (a MeSH indexing term). However, due to the length of time hydrogen peroxide has been on the market as an antiseptic and oxygenating agent, many important studies relating to safety and physiological effects were published prior to 2000. It is only the more recent studies that comment on its intra-oral use as it interacts in the complex milieu of human oral ecology as we understand it today. In the interest of capturing essential information, the section on hydrogen peroxide is treated as necessary background in formulating professional opinion on its safety as the active ingredient in this elective therapy.

Finally, there is a summary of studies specifically on the surface effects of hydrogen peroxide on the tooth. Again, certain historical studies were included to give the reader a full scope of information; however, the majority of the work reviewed falls within the 2000 to 2002 time period.

PRELIMINARY INFORMATION

Hydrogen peroxide as an agent

Hydrogen peroxide has been used in medicine and dentistry for many years. Although its typical use has been as an intra-coronal bleaching agent for non-vital teeth, more recent uses in the dental field include dentifrice formulations (in combination with sodium bicarbonate) and as a topical bleaching agent for the esthetic enhancement of vital teeth. The most common formulation is carbamide peroxide that, when activated in the mouth, releases hydrogen peroxide (H_2O_2), the ratio being 10% carbamide peroxide equal to 3.5% hydrogen peroxide. This formula should be considered when evaluating any professional or home-use tooth whitening product.

H_2O_2 is a colourless, odourless liquid that releases oxygen (oxidizing agent) upon exposure to, and in positive correlation with, heat and light. It is slightly acidic (5.0 – 6.0) at low concentrations and becomes more acidic as the concentration increases.⁶ It is contraindicated for use with other acids, acetones, alcohols, ammonia, and a variety of metals including copper and gold.⁷ Given the direct correlation of time, dose, and concentration to intra-oral side effects, the use of H_2O_2 for vital tooth whitening is of interest as this process requires each of these factors for maximum results (see Table 1).

APPLICATION	mg/dose	PERCENTAGE	TIME
"Power bleaching" (heat and light)	??	30% – 35%	5 min/treatment
Root canal (intra-coronal/non-vital)	??	30% – 35%	30 min/treatment
Original at-home bleaching (NVNG)	25 mg	3.5%	8 hours/day x 2–6 wks
New "trayless" strips (OTC)	11 mg	5.3%	30 min x 2 for 14 days
New "trayless" strips (professional)	13 mg	6.5%	30 min x 2 for 21 days
Mouthrinse	450 mg	1% – 3%	1–5 min twice a day
Dentifrice	??	0.75%	1–5 min twice a day

Table 1. Comparison of hydrogen peroxide formulations and intra-oral uses

There has been considerable controversy and concern regarding the safe use of H_2O_2 in the mouth, especially after a ban of its use in tooth whiteners was issued by the United Kingdom Court of Appeal.⁸ Rigorous investigation has been applied to validating its use in a non-therapeutic regimen with conclusions of relative safety and efficacy in a low concentration formulation.⁹ This was despite the findings that even a 30-minute exposure with 3% H_2O_2 may initiate the inflammatory process in skin, including oral mucosa, respiratory, digestive, and ocular tissues.¹⁰ This hazard rating (at 3% concentration) is slight but becomes severe as concentrations increase to 30% because of the corrosive nature of H_2O_2 .¹¹ The use of a rubber dam is recommended in conjunction with the higher concentrations used in the "power bleaching" tech-

niques during *in-office* procedures.

Ill effects caused by ingestion may include nausea and vomiting with the most severe effects occurring at concentrations exceeding 10%. Studies have shown, however, that even hyperplastic gastric tumours reverted to normal when the ingestion of H_2O_2 ceased.¹² It should be noted that ingestion studies (effects and reversals) cannot be performed on humans; the mouse model is the most accepted model.

Of particular interest to dental professionals is any potential carcinogenicity, H_2O_2 being a reactive oxidant. Free radicals have been implicated in cell membrane damage¹³ and consequent generation of a highly reactive hydroxyl radical¹⁴ capable of mitochondria destruction. Free radicals have also been implicated in DNA strand breaks¹⁵ and fibroblast destruction in gingival tissue¹⁶ with as little as 0.03% concentration H_2O_2 . However, all these cytotoxic effects have been shown to be reversible following non-lethal dosages.¹⁷

Hydrogen peroxide safety in the oral cavity

Humans have a powerful defence system in the form of antioxidants that act as free radical destructors. These include such common nutrients as vitamins C and E, beta-carotene, coenzyme Q10, and the trace elements selenium and zinc.¹⁸ Additionally, we have specific enzymes present in tissue and even in the saliva that are directed specifically to free radical dispersion. The most effective of these is superoxide dismutase, a major antioxidant. Catalase is also invaluable in preventing cellular damage; it has been shown to dissipate residual hydrogen peroxide in the oral cavity within three minutes.¹⁹ Catalase is present in adequate supplies in human saliva and serum²⁰ but is low in contrast in the dental pulp tissues.²¹

A study by Weitzman et al.²² was initially responsible for augmenting concerns of co-carcinogenicity, in conjunction with the aromatic hydrocarbons found in tobacco. They painted the buccal cheek pouches of hamsters with 3% or 30% H_2O_2 in conjunction with DMBA (the equivalent of smoking by-product) and evaluated at 19 and 22 weeks. Although Weitzman concluded that H_2O_2 was a co-carcinogen, the results were refuted by Marshall et al.²³ due to the small animal sample and the low significance levels even at the 30% concentration. Similar confirmation was cited in a study where 6% or 30% H_2O_2 showed weak correlation to papilloma formation.²⁴ One study even reported a reduced co-carcinogenicity for DMBA when applied with 3% H_2O_2 .²⁵

In 1999, at the American Association of Dental Research conference, a poster was presented that concluded carcinogenicity potential for H_2O_2 .²⁶ It was subsequently withdrawn six days later²⁷ after terse criticism regarding the strong conclusions drawn on the limited data.

In the light of presented evidence, we must surmise that the carcinogenic potential of H_2O_2 is a multifactorial process. Direct and prolonged contact with the tissues is required at concentrations high enough to mutate, yet not kill, the tissues; this contact has to be coupled with failed antioxidant agents and the availability of free radicals to attack the DNA of any surviving cells and there must also be failure of DNA repair mechanisms.²⁸ The best evidence against the carcinogenic capabilities of H_2O_2 overall is the successful use of the product in the population. During this raging controversy, use over the years has continued and we have now accumulated over a decade of results in the field. A rise in intra-oral can-

cerous lesions, as would be associated with vital tooth bleaching, has not been reported in the literature nor by the agencies responsible for monitoring disease incidence in the population.

It appears that the use of H_2O_2 in vital tooth whitening finds a safe balance in the complex intra-oral ecosystem where the body strives to maintain homeostasis. The controversy therefore dissipates as time passes.

Colorimeter description

In the interest of reader comprehension, a description of the colorimeter—an objective quantitative device—is warranted as the majority of researchers are employing it to reduce subjectivity in tooth shade changes. (See Figure 1.)

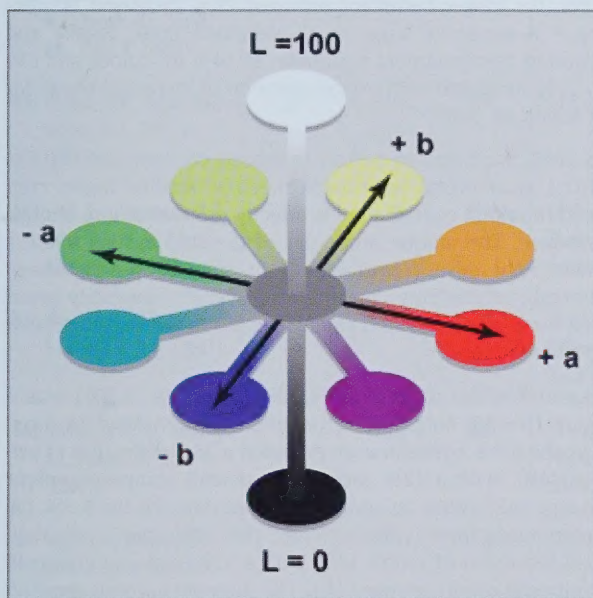


Figure 1. L*a*b* color model (courtesy of the *Journal of Contemporary Dental Practice*)

A colorimeter evaluation of shade change is based on the Commission Internationale de l'Éclairage (CIE) colour model that defined three colour "spaces" in 1978:²⁹ L* (black/white continuum); a* (red/green continuum); and b* (yellow/blue continuum). The system is known as the CIELAB scale. Standardized digital images are recorded with a high resolution camera and motorized zoom lens using standard polarized lighting. This data is transformed into the three-dimensional colour space CIELAB evaluation that measures, as a positive or negative value, L* as the increase or decrease of lightness, a* as increase or decrease of redness, and b* as the increase or decrease of yellowness. The three values combined give an overall accurate description based on an objective measure rather than the subjective evaluations from earlier shading systems such as the Vita® shade tabs. This system assigned a colour by evaluating, with the naked eye, the closest match from a selection of 1–16 shade tabs. The system is not arranged in an equidistant linear evolution of whiteness, from level 1 to level 16, but is rather numbered to depict shades that closely approximate the most common colours seen in the oral cavity. The use of the CIELAB system has made it possible to do comparison studies with much greater accuracy. Readers should determine the type of colour evaluation system used when attempting to draw comparative conclusions from any selection of studies.

COMPARISON TRAY STUDIES

In the first of the comparison studies, Nathoo et al.³⁰ evaluated Colgate Platinum® Gentle Plus (5% carbamide peroxide; equal to 1.8% H_2O_2) against Nite White® Excel 2 "Z" (10% carbamide peroxide; equal to 3.6% H_2O_2). Each of these products is a home tray system and has added potassium nitrate, presumably to combat the sensitivity associated with vital tooth whitening. The study was a parallel group, double-blind, randomized (stratified for age, gender, and tooth shade) design with 60 subjects. The trays were worn for 6–8 hours per day for 7 days. There was no significant difference in whitening results at the end of the trial. However, the lower concentration of H_2O_2 was associated with less hypersensitivity.

Several other studies compared whitening in differing concentrations. Kihn et al.³¹ compared the two formulations of NUPRO Gold Tooth Whitening Systems, 10% and 15% carbamide peroxide (3.6% and 5.4% H_2O_2 respectively). This study used 57 subjects in a double-blind, randomized trial for 14 days with a two-week follow-up. The subjects were instructed to wear the trays for at least 4 hours and up to 8 hours per day. There was no reported difference in tooth whitening at 7 days, but a significant difference was reported for the higher concentration at 14 days, continuing to the two-week follow-up. There was no sensitivity difference between the two groups, irrespective of the fact that the 15% formulation has added fluoride.

A similar study comparing Opalescence Dental Whitening Agent 10% with the Opalescence F 15% showed the same findings until week six when colour differences between the two concentrations were no longer detectable.³² It was concluded from these studies that desensitizing agents added to the formulations are not effective enough to warrant inclusion, especially as sensitivity is transient and subsides upon completion of the whitening process. Until that time, clients can expect increased sensitivity in direct correlation with the percentage of the concentration. Whitening capabilities appear to be initially greater for the 5 ± % agents but tend to regress to similar levels in a relatively short length of time; the overall increase in whitening being in the range of 7 to 15 shades on the Vita® scale.

The fourth comparative study evaluated Opalescence Tooth Whitening Gel PF 20% carbamide peroxide (7.2% H_2O_2) versus Day White 7.5% H_2O_2 .³³ This study was well designed as a double-blind, randomized trial with 24 subjects for 14 days. Subjects wore the trays for one hour, twice daily, and returned for follow-up for selected periods up to 12 weeks. Although the higher concentration initially gave better results, there were no differences in tooth lightness at the end of the study. The results showed colour stabilization within four weeks, a result also shown in a six-month study by Matis et al.³⁴ The study confirms that a longer follow-up period should be considered to allow for colour regression if the objective is to determine overall colour lightening.

TRAYLESS EVOLUTION

In assessing the two most frequent side effects associated with tooth whitening, gingival irritation and tooth sensitivity, the delivery tray has been implicated.^{35,36} It can abrade tissues and cause inadvertent orthodontic movement. Individuals with temporomandibular dysfunction may not tolerate the bulk of the bleaching tray and others may be pro-

hibited from whitening due to a severe gagging reflex or to the presence of certain appliances. New methodology was therefore investigated.

The new Whitestrips™ technology employs a flexible 9 µm polyethylene strip superimposed with tiny reservoirs, 0.13 cm across and 0.015 cm deep, that allows a consistent distribution of the active H₂O₂ gel at either 5.3% or 6.5% (over-the-counter [OTC] or professional formulations). They are specifically designed to adapt to either the maxilla (6.5 x 1.5 cm rectangle) or the mandible (5.0 x 2.0 cm trapezoid) and are pressed onto the facial surface and folded over to the lingual for anchor; the viscous, sticky gel holds them in place.³⁷ The gel is polyacrylic acid polymer (Carbopol®), which is made up of glycerin and water, the carrier medium for the H₂O₂ at 5.8pH. The OTC formulation is the lower concentration of 5.3%, designed to be worn for 30 minutes a day for 14 days while the higher concentration of 6.5% is dispensed professionally and is to be worn at home in the same manner for 21 days. Peroxide levels on the tooth have been measured at 1.9% after 30 minutes, depleting gradually due to interaction with saliva (dilution) and also to transport of the peroxide ion into the tooth surface for whitening. Although the process is not completely understood, it is believed that H₂O₂ transport occurs via a concentration gradient, from the higher percentage at the surface of the tooth into the enamel through the prismatic spaces to areas of lesser concentration.

The strips require no custom fabrication, are individually packaged, come pre-loaded with a consistent concentration of H₂O₂ gel, and are disposable. This new technology holds promise for the convenience and compliance factors held so critical in our western society values.

WHITESTRIP™ STUDIES

The Whitestrip™ studies (see Table 2) generally progress from the 5.3% OTC formulation to the 6.5% professional-use product, in keeping with the order of product development.

The first study in this search was a parallel group, double-blind, randomized, placebo-controlled design that delivered 5.3% H₂O₂ twice a day (BID) over 14 days.³⁸ The results showed a significant whitening effect over the placebo alone. Adverse effects were slight, occurring in fewer than 10% of the subjects with three subjects having transient gingival inflammation in the subject panel (N = 66). There was no soft tissue pathology of note in either group. A second study of similar design gave comparable results.³⁹

One early Whitestrip™ study by Gerlach et al. compared 5.3% strips to various percentages of H₂O₂ in a tray-based system.⁴⁰ The study was a parallel group, examiner-blind, randomized, placebo-controlled design with 36 subjects over 14 days. Results showed the strips equal to to the 10% carbamide peroxide (3.5% H₂O₂) in final whitening effect. This study, as do the majority of the more recent whitening studies, used the colorimeter evaluation for whitening effect because of its more objective measure.⁴¹ The results showed whitening across all colour parameters, reduction of yellow (Δb), increased brightness (ΔL), and overall composite colour change (ΔE). Tooth sensitivity was minimal in the strip and 10% formulations and increased correspondingly with the higher percentages (10% and 15%).

Increased oral irritation has been reported with both concentrations when pre-strip brushing is performed;^{42,43} a warning

not to brush before applying strips appears on the packaging. Of note was the fact that the strip system resulted in more consistent whitening results compared with the tray systems (standard deviations, which indicate the average variance from the mean, were generally double the variance for the tray studies). This is presumably due to the more even distribution and amount of gel within the pre-loaded reservoirs. Subject compliance was also higher with the strip system and this would directly affect whitening results.

A study published in abstract by Swift et al.⁴⁴ shows similar results over a longer time period; another abstract, comparing 5.3% strips to a placebo and a whitening dentifrice, also shows strip supremacy.⁴⁵

Gerlach et al. compared 5.3% strips for 14 days versus 28 days; the longer treatment provided 29% increased whitening.⁴⁶ A study by Sagel et al. validated these results and reported post-treatment regression as 14% for colour and 8% to 42% for shade with overall duration of increased shade for at least two years.⁴⁷

In 2002, we begin to see an increased concentration (6.5% H₂O₂), as an evolution of the Whitestrip™ studies; higher concentration and contact time is directly proportional to clinical response. The unique properties of the strip system allow a lower total dose (see Table 1) in spite of the increased strength, which may contribute to overall tolerability given that tooth sensitivity and gingival irritation are also correlated to concentration.⁴⁸

The first of the comparison studies (5.3% vs. 6.5%) was a small (N = 30) single-blind, parallel design.⁴⁹ After 14 days' use, the 6.5% concentration provided a 28% reduction of yellow (Δb), with a 12% increase in overall composite colour change (ΔE). With an additional seven days for the 6.5% (as per manufacturer's instructions), the final result tallied at 61% reduction of yellow (Δb) with a 52% increase in overall composite colour change (ΔE). The increase in tooth sensitivity with the 6.5% was negligible.

In comparing the professional-strength formulation with a popular tray system (a parallel group, examiner-blind, randomized design with 20 subjects over 14 days), it was concluded that the strip system resulted in significant overall improvement over the tray system (209% vs. 62% respectively).⁵⁰ These results represent actual manufacturer instructions that gave the tray system 28 contact hours over the 14 contact hours required for the strip system.

Increased incidence of fluorosis^{51,52} and re-mineralized white spot lesions in children^{53,54} undergoing orthodontics are two situations where tooth whitening could benefit a population previously unstudied in the literature.

In a large (N = 106), eight-week, randomized study for volunteers ages 11–18 years, subjects were evaluated for overall whitening and oral tissue response.⁵⁵ The tray group, 10% carbamide peroxide (3.5% H₂O₂), had a total of 448 contact hours while the strip group had at total of 56 hours. The maxillary teeth whitened in a comparable manner; however, the mandibular teeth showed a statistically significant improvement (p < 0.05) with use of the trays over the strips. The groups were not stratified for orthodontic misalignment and it is possible this compromised contact to the teeth by the strips. A post-orthodontic study, where teeth were presumably aligned, gave comparable results for both trays and strips.⁵⁶ A debate for greater sensitivity (thinner dentin) or

STUDY REFERENCE NO.	SUBJECTS	H ₂ O ₂ % IN STRIP	DAILY APPLIED	LENGTH OF STUDY	COMPARISON OR CONTROL	CONCLUSION	STUDY TYPE
38: Kugel, G., Kastali, S. (2000)	66 (33 in each group)	5.3%	BID	14 days	Placebo/strips	Strip greater shade (p<0.0001)	CCT, RCCT
39: Kugel, G., Kastali, S., Sagel, P.A., Gerlach, R.W. (2001)	70	5.3%	BID	14 days	Placebo/strips	Strip greater shade	RCCT
40: Gerlach, R.W., Gibb, R.D., Sagel, P.A. (2000)	36	5.3%	BID	14 days	10%, 15%, 20% trays (=3.5%, 5.4%, 7.2% H ₂ O ₂)	Strips = 10% tray	RCCT *
42: Gerlach, R.W., Jeffers, M.J., Pernik, P.S., Sagel, P.A., Zhou, X. (2001)	41	5.3%	BID	14 days	Pre-brushing	Increased oral irritation	Randomized clinical trial
43: Gerlach, R.W., Sagel, P.A., Jeffers, M.J., Zhou, X. (2002)	36	5.3% 6.5%	BID	14 days	Pre-brushing	Increased oral irritation	RCCT
44: Swift, E.J., Heymann, H.O., Ritter, A.V., Rosa, B.T., Wilder, A.D. (2001)	36	5.3%	BID	14 days; 21-day duration	10%, 20% trays (=5.4%, 7.2% H ₂ O ₂)	Strips = 10% tray; shade retention greater	RCCT
45: Simon, J.F., McClanahan, S.F., Gerlach, R.W. (2001)	50	5.3%	BID	14 days; 49-day duration	Placebo/whitening dentifrice	Strips superior	Randomized placebo-controlled clinical study
46: Gerlach, R.W., Campolongo, K.L., Hoke, P.D., Zhou, X. (2001)	93	5.3%	BID	14 and 28 days; 180-day duration	Placebo	29% greater whitening	Randomized double-blind, double-placebo-controlled clinical study
47: Sagel, P.A., Walters, P.A., Gibb, R.D., Gerlach, R.W. (2001)	27	5.3%	BID, QD	180-day duration	Comparison	29% greater whitening and retention	Randomized clinical study
49: Sagel, P.A., Jeffers, M.E., Gibb, R.D., Gerlach, R.W. (2002)	22	5.3% 6.5%	BID	14 and 21 days; 21-day duration	Comparison	6.5% greater whitening over 52%	RCCT**
50: Gerlach, R.W., Zhou, X. (2002)	20	6.5%	BID	14 days	10% (3.5% H ₂ O ₂) trays	Strip greater whitening 62%–209%	RCCT***
55: Donly, K.J., Segura Donly, A., Baharloo, L., Rojas-Candelas, E., Garcia-Godoy, F., Zhou, X., Gerlach, R.W. (2002)	106	6.5%	BID	14 days; 56-day duration	10% (3.5% H ₂ O ₂) trays	Greater mandible tray whitening 29%	RCCT
56: Donly, K.J., Gerlach, R.W., Segura, A., Walters, P.A., Zhou, X. (2001)	30	5.3%	BID	14 days; 56-day duration	10% (3.5% H ₂ O ₂) trays	Similar results	RCCT
58: Kugel, G., Aboushala, A., Zhou, X., Gerlach, R.W. (2002)	40	6.5%	BID	14 days; 180-day duration	10% (3.5% H ₂ O ₂) trays	Strip greater shade 66% (p<0.01)	RCCT

RCCT: Randomized controlled clinical trial CCT: Controlled clinical trial

* Random, controlled, parallel group clinical trial ** Single-site, parallel, examiner-blind clinical trial *** Randomized, parallel, examiner-blind clinical trial

Table 2. Summary of clinical studies on whitening strip technology

lesser sensitivity (larger pulp chambers) in children was settled as results indicated similar sensitivity patterns when compared with studies in adults.

The final population to be studied with strip technology was those with tetracycline stain. This population suffer significant cervical stain of the blue/gray hue, thought to be the most difficult to whiten. Tetracycline stain typically requires a longer treatment regimen of weeks to months.⁵⁷ A randomized clinical trial evaluated the 6.5% H₂O₂ strips against 10% carbamide peroxide (3.5% H₂O₂) in a subject panel of tetracycline-stained people (N=40).⁵⁸ Treatment continued for two months after which significant improvement was seen in both groups with the strip group being superior in overall results by 66% ($p < 0.01$). Whitening occurred faster in the strip group as well, with four shades vs. one shade improvement after one month, a fact that was statistically significant. It was interesting to note that although both groups had similar tooth sensitivity and oral irritation (slight) early in the study, there were no clinical manifestations recorded at either the one- or two-month examination.

SURFACE EFFECTS STUDIES

The intra-oral hard tissues, enamel, dentin, and any composite materials, have also been of concern when a client undergoes the process of tooth whitening. It has been reported that the greater the peroxide concentration, the more acidic the pH of the bleaching product.⁵⁹ Demineralization of the enamel structure occurs at critical pH 5.5.⁶⁰ Thus evaluation of currently used whitening agents is essential. Price et al.⁶¹ did a comprehensive comparison of four groups of whitening agents: over-the-counter (OTC) whitening products, whitening toothpastes (TP), dentist-supervised home bleaching (DSHB) agents, and in-office bleaching (IOB) treatments. They found a considerable range from very acidic (3.67) to highly basic (11.13). Overall, the OTC products had a mean pH of 8.22 ± 2.0 , the TP were 6.83 ± 1.27 , the DSHB products were 6.48 ± 0.51 , and the IOB agents 5.56 ± 1.64 (see Table 3). From this data, we can surmise that the products that carry a higher risk for enamel demineralization are those delivered in-office. These are generally of a higher concentration and may be applied with additional heat for a faster and more profound effect. One fact to consider when evaluating an *in vivo* situation is that the release of ammonia and carbon dioxide, which occurs during the whitening process, elevates the pH of the oral cavity to a more basic ecology within 15 minutes.⁶² Surface effect studies are therefore best done on teeth whitened within the oral cavity although this is a more difficult study to conduct as surface analysis, post-bleaching, most often calls for extracted teeth.

PRODUCT	pH	STANDARD DEVIATION
TP (toothpaste)	6.83	± 1.27
OTC (over-the-counter)	8.22	± 2.0
DSHB (home bleaching)	6.48	± 0.51
IOB (in-office bleaching)	5.56	± 1.64

Table 3. Comparison of pH levels in whitening products

There are several ways to evaluate surface changes post-bleaching on the enamel/dentin surface. In examining inorganic substrates (calcium Ca and phosphorus P), electron probe analysis⁶³ showed lowered concentrations of both min-

erals with the use of 10% carbamide peroxide (3.5% H₂O₂) while infrared spectroscopy showed no effects at this level. However, at 35% carbamide peroxide (12.58% H₂O₂), some loss of mineral content was noted.⁶⁴ The clinical significance of these findings is difficult to determine as calcium and phosphates are both elements of the saliva and can replenish any lost content in the enamel. Cimilli and Pameijer⁶⁵ report that longer duration and higher concentrations are more likely to exhibit an effect. However, a study utilizing overnight trays for 14 days showed minimal effect on surface morphology.⁶⁶

On examining enamel microhardness, some agents demonstrated increased hardness while others showed decreased hardness.^{67,68} One study differentiated enamel from dentin and reported that a 10% carbamide peroxide (3.5% H₂O₂) agent can alter the microhardness of sound and demineralized enamel but not in sound and demineralized dentin.⁶⁹ Another study, which examined both tray and strip technology, reported no significant micromorphological changes in subsurface enamel, the DEJ, or the dentin.⁷⁰

Other factors of interest centre around restorations affected by bleaching. Aside from the obvious—that composites remain unchanged in colour post-bleaching—there is a concern that pulpal changes may occur due to seepage of H₂O₂ around restorations. Several studies have previously reported carbamide peroxide diffusing into the pulp,⁷¹ that it is a risk to the pulpal tissue,⁷² that it may cause reversible histologic damage to the pulp,⁷³ and that it may penetrate more readily around restored teeth.⁷⁴ However, the authors conclude that it is not clear what concentration does irreversible damage to the pulp, so questions still remain. We can only assume that, since the endodontic incidence of bleached teeth has not risen perceptibly in the last decade, perhaps the bleaching process is safe in this regard.

The final area of evaluation in this search was focused on the shear bond strength of the newly bleached tooth undergoing replacement of composites. Cavalli et al. reports that initially (for two weeks post-bleaching) the enamel/resin bonds were low. However, they returned to normal at three weeks. These results were similar across all home-use concentrations of H₂O₂.⁷⁵

RESULTS OF REVIEW

Vital tooth whitening has evolved significantly since its popular inception in 1989. The comparison tray studies revealed efficacy with all products tested showing few differences between bleaching products. The increasingly rigorous studies, most notably with the more recent trials conducted with the Whitestrip™ technology, have served to document data addressing the most pressing issues. Tooth whitening improves esthetics with the minimal and transient side effects of tooth sensitivity and minor oral irritation. Higher concentrations of H₂O₂ applied for longer periods of time give the best results. New strip technology can deliver the required strength with an overall lower dose in a shorter period of time, giving the optimum results with the fewest side effects. Children suffering from post-orthodontic or fluorosis spotting now have an alternative and less invasive treatment option. Those with tetracycline stains will also benefit from this type of therapy.

Effects on enamel, in both organic and microsurface hardness, are contradictory and clinical significance is question-

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able due to the natural tendency for the oral ecology to return the oral cavity to norm. When applying new composite restorations to teeth, post-bleaching, it is recommended to wait three weeks to ensure maximum bond strength.

Overall, vital tooth whitening has become more acceptable to both client and clinician, given the trend toward comprehensive study design that identifies the most ideal concentrations, contact times, and safety of both hard and soft tissues. Additionally, new colorimeter techniques quantify the final whitening results objectively.

DISCUSSION AND CONCLUSIONS

When vital tooth whitening was first introduced, it was a very questionable procedure. Little was known at the time about the complexity of the oral ecology and how the active ingredient, hydrogen peroxide, would be broken down and dissipated within the mouth. Studies performed in the laboratory, without the benefit of the modulating effects of the human immune system, indicated that H_2O_2 could be a dangerous agent. Most would defend the ethics, given that vital tooth whitening is an elective procedure and all our clients give informed consent. However, how informed was anyone, including the professionals, given the dearth of information on this therapy at the time?

In the past decade, the research has evolved in several separate areas; the formulations have improved, lowering the pH, reducing and controlling the dose and time while increasing the efficacy in the concentration and refining the delivery system; the measurable outcomes have been improved in new methodologies (the colorimeter) to better quantify the results; the study designs have improved with the newest studies on Whitestrips™ being outstanding examples of sound research; and finally, the collateral research on the oral ecosystem has given us new-found confidence on the human immune system and its ability to return the oral cavity to "norm" even after a 30-minute application of H_2O_2 .

All this research has developed concurrently, finally merging to enhance each discipline and give us the answers needed to provide professionals with confidence in this elective therapy. Our society, rightly or wrongly, is demanding improved esthetics and the pressure is on the professional community to provide these choices only when they have been shown as safe and effective by randomized and controlled clinical trials. Our early efforts were marginal in their conclusions and government funding of these types of studies was minimal. It has taken the combined efforts of university, government, and industry to finally begin to generate the evidence-based background we need to ensure professional confidence in recommending this treatment.

There is still room for improvement; the strip technology is still new. I foresee improvements in flavour, cost, time, efficacy, ease-of-use, and overall convenience and availability.

But for now, the most important issue—safety—has some further proof. As hygienists, with the safety and efficacy issues at rest, we can feel more confident in advocating vital tooth whitening. Our clients look to us for professional judgment; we must believe in the information we provide when attaining their informed consent. It appears that we now have the beginnings of a good and well-designed evidence base on the issue.

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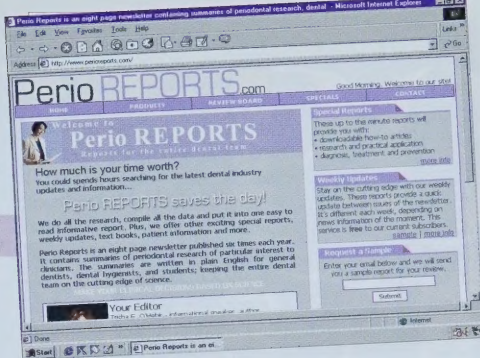
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BY KAREN WOLF, DipDH



Summer is almost here and I hope you are planning to go off exploring the great out-of-doors. To save you some valuable time and energy, I am suggesting a couple of sites that can help you continue your education more quickly and efficiently.

Perio Reports (www.perioreports.com)

To quote from this web site: "How much is your time worth? You could spend hours searching for the latest dental industry updates and information. Perio Reports is an eight-page newsletter published six times each year. It contains summaries of periodontal research of particular interest to clinicians. The summaries are written in plain English for general dentists, dental hygienists, and students, keeping the entire dental team on the cutting edge of science."

Some of the journals reviewed are *Journal of Periodontology*, *Journal of Clinical Periodontology*, *Journal of Periodontal Research*, *Journal of Dental Research*, *Journal of Public Health Dentistry*, *Journal of Dental Hygiene*, and the *Journal of the International Academy of Periodontology*.

Also available at this site is the *Compendium of Current Research*, which is an eight-year collection of Perio Reports in a 443 page soft-cover textbook containing over 500 research summaries, research definitions, and indices. There are also Special Issue Reports where you can access research and downloadable how-to articles. Check the web site for ordering options and prices.

DH Forum – Continuing Education for Dental Hygienists (www.marquette.edu/dhforum/)

This site is "an educational forum created for the Internet consisting of a series of case-based learning files for Dental Hygiene treatment plans." There is a step-by-step guide for accessing the courses, a guide that even the most novice applicant will find user friendly. After you have completed the course with a pass mark of 70 per cent or higher, you will be sent your CE credit by mail (the option to retake the course within 30 days is available if your test percentage falls below 70).

Examples of courses listed:

- *Bacterial Endocarditis* (two credits): "Review the current recommendations and incorporate information on bacterial endocarditis into the dental hygiene treatment plan for the patient with a high risk and need for antibiotic premedication."
- *Dental Erosion* (one credit): "Develop the ability to perform a risk assessment for dental erosion. Incorporate this information into the dental hygiene treatment plan for the high risk patient that includes preventive measures."
- *Tongue Piercing* (one credit): "Gain an understanding of tongue piercing and its potential complications; identify the roles of a dental hygienist in dealing with the patient with a pierced tongue."
- *Tuberculosis* (two credits): "Receive an update on the disease of tuberculosis, including the etiology, types, signs, treatment options, and recent changes in the methods of prevention. Provide a specific dental treatment plan that includes and integrates the general and oral considerations of a patient with a history of tuberculosis."

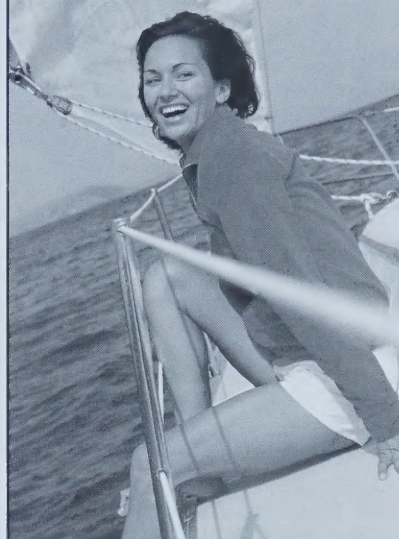
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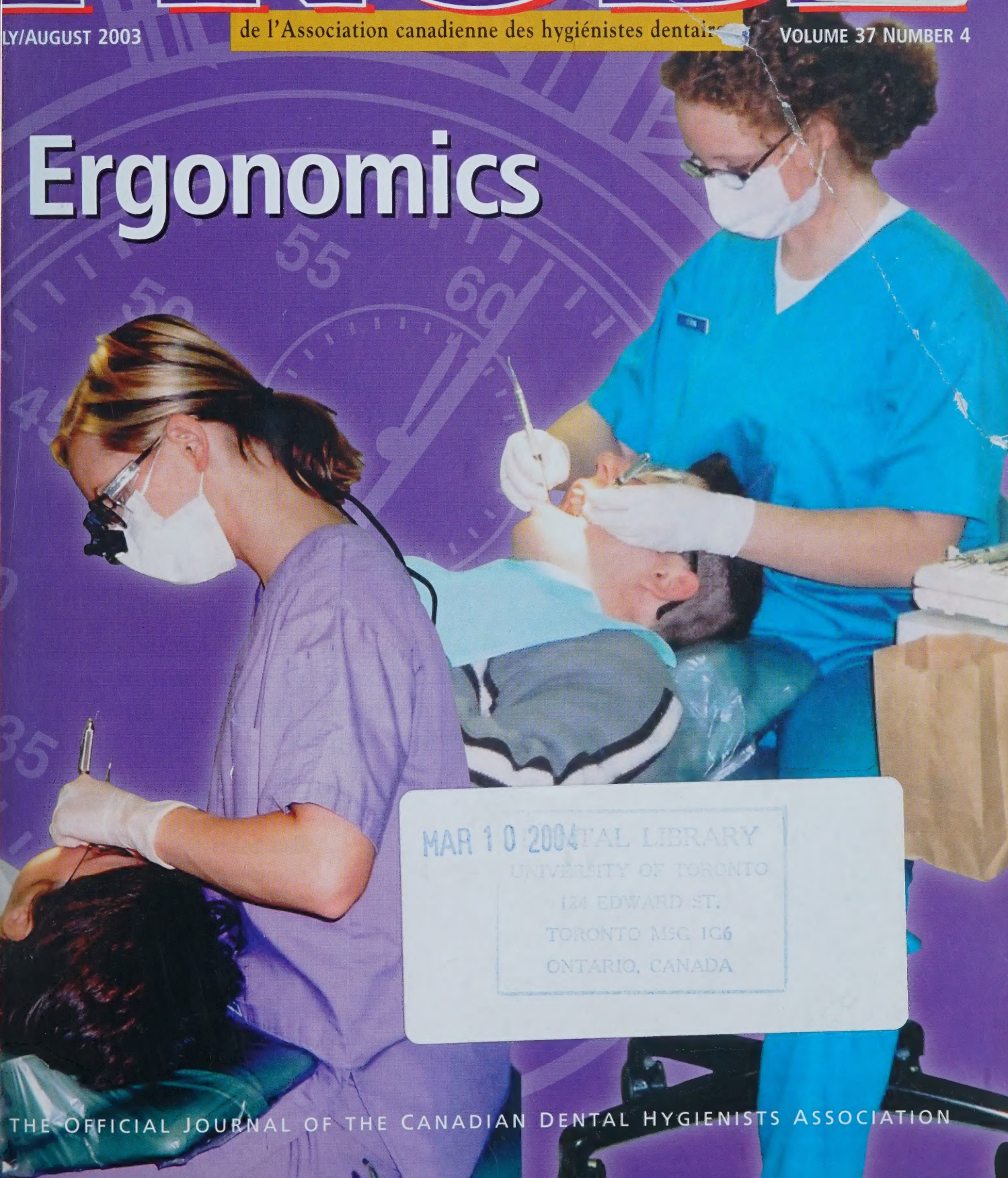
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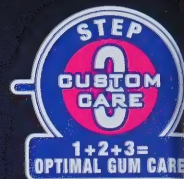
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Unlimited Capabilities

by Karen Wolf, DipDH



A few months ago (in the March/April 2003 issue), I talked about the changing world, about the battle scars associated with changing our world, and also about never giving up on the dream. And in my last message in *Probe* (May/June 2003), I spoke about creating new conditions—achievable, adaptable conditions for which we would be accountable both as individuals and as an organization. Change is all around us and we must be aware of what we are capable of achieving during these unpredictable times.

In this issue of *Probe*, you will be reading about the science of ergonomics. “Ergonomics” comes from two Greek words, “ergon” meaning work and “nomos” meaning law or custom. In short, ergonomics is the study of human capabilities in relationship to work demands. Using this theme, we can look at the natural laws of our profession and examine how the issues facing us today challenge our capabilities as individuals and as an organization.

As dental hygienists, we are a valuable part of the oral health team as well as the health care team at large. We help prevent oral diseases and work to promote oral health in relationship to total wellness. This is what we **do** and we do it very effectively. Our education and practical training help define our practice standards, scope of practice, and code of ethics—our “natural laws.” This, however, is only the beginning of defining who we are as professionals.

Our capabilities extend into the community, beyond the four walls of a clinical practice. We are equipped to meet the demands we will face in all practice settings. All we need now is support from governments and reimbursement agencies. We know our limitations. Now we need to explore our boundaries and create new conditions. I return again and again to this statement by Charles Ringma: “New conditions can be significant in producing new men and women, and new men and women can help to create new conditions.” It is my dream to see dental hygienists able

Au sujet des capacités illimitées

par Karen Wolf, DipDH

Il y a quelques mois (dans le numéro de mars/avril 2003), j’ai parlé du monde en changement et des cicatrices de guerre associées au changement de notre monde. J’ai aussi exhorté à ne jamais abandonner notre rêve. Et, dans mon dernier message dans *Probe* (mai/juin 2003), j’ai abordé la création de nouvelles conditions — des conditions réalisables, adaptables pour lesquelles nous serions redevables à la fois en tant qu’individus et comme organisation. Le changement est omniprésent et nous devons être conscients de ce dont nous sommes capables de réussir à l’ère de l’imprévisibilité.

Dans ce numéro de *Probe*, on vous propose des articles portant sur la science de l’ergonomie. « Ergonomie » vient de deux mots grecs : « ergon », travail, et « nomos », loi ou coutume. En bref, l’ergonomie, c’est l’étude des capacités humaines par rapport aux exigences du travail à faire. En nous servant de ce thème, nous pouvons jeter un coup d’œil aux lois naturelles de notre profession et examiner dans quelle mesure les enjeux que nous avons à affronter aujourd’hui interpellent nos capacités comme individus et comme organisme.

À titre d’hygiénistes dentaires, nous représentons un élément très utile de l’équipe de santé buccale tout comme de l’équipe de soins de santé dans son ensemble. Nous aidons à prévenir les maladies buccales et nous travaillons à promouvoir la santé buccale en relation avec le bien-être total. C’est ce que nous **faisons** —, et avec efficacité. Notre éducation et notre formation pratique aident à définir nos normes de pratique, notre domaine de pratique et notre code de déontologie, c’est-à-dire nos « lois naturelles ». Cependant, ce n’est là que l’amorce de la définition de notre identité professionnelle.

Nos capacités ont un prolongement dans la collectivité, au-delà du cercle fermé d’une pratique clinique. Nous sommes outillées pour répondre aux demandes auxquelles nous sommes confrontées dans tous les milieux de pratique. Tout ce dont nous avons maintenant besoin, c’est de l’appui des gouvernements et des agences de remboursement. Nous

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GETTING THE LEAD OUT



Lead exposure is associated with an increased prevalence of dental caries as well as cognitive and behavioral problems in children.

Lead intake is more prevalent and potentially more harmful than you may think. Although environmental exposure to it may have declined in recent years, lead is accumulated and stored in the bones where it has a half-life of approximately 62 years.¹ Relatively harmless while locked up in the bones, lead is potentially damaging when introduced into the bloodstream. A major cause for concern is that because of its long half-life—and because lead levels in the blood are elevated during pregnancy—maternal exposure to lead even decades before conception can subsequently result in fetal exposure when lead is released from the bones during pregnancy.^{1,2}

What are the risks of lead exposure? A large-scale study of almost 25,000 individuals aged two years and older has shown that as little as a 0.24 µmol/L (5 µg/dL) change in blood lead levels may explain

in part the increased risk of dental caries in children aged five to 17 years.³ What's more, a well-controlled animal study demonstrated that prenatal and perinatal lead exposure was linked to an almost 40% increase in the prevalence of dental caries.¹ But not only do teeth suffer. Skeletal lead stores are also believed to contribute to aggressive childhood behaviour,^{4,5,6} delayed puberty in girls,⁷ hypertension,⁸ and even brain and kidney damage.^{4,9} Epidemiological studies have also indicated a direct link between increased blood lead levels and intellectual impairment in children, even at successively lower lead levels.⁶

The good news is that dietary calcium helps prevent lead toxicity both by blocking the intestinal absorption of lead from food sources (e.g., grapes, berries, salad greens) and by reducing the release of bone lead into the bloodstream, even prenatally.^{1,2,4,9} In pregnant women with even low exposure to lead, relatively high intakes of calcium (>2000 mg/day[†]) have been shown to decrease blood lead concentrations, potentially minimizing fetal exposure.² Unfortunately, most of us consume less than the minimum recommendation of two to three daily servings of milk products—the major source of calcium in the Canadian diet.¹⁰ A shame, since something as simple as adding cheese—an excellent source of calcium—to salad sharply reduces absorption of the lead contained in the salad greens.⁹

[†] The safe upper level for calcium is 2,500 mg/day.

Dairy calcium consumed by expectant mothers attenuates fetal accumulation of lead and may reduce the risk of childhood dental caries.

References: 1. Watson GE et al. 1997. Influence of maternal lead ingestion on caries in rat pups. *Nature Medicine* 3:1024-1025. 2. Johnson MA. 2001. High calcium intake blunts pregnancy-induced increases in maternal blood lead. *Nutr Rev* 59:152-156. 3. Moss ME et al. 1999. Association of dental caries and blood lead levels. *JAMA* 281:2294-2298. 4. Bogden JD et al. 1997. Lead poisoning—one approach to a problem that won't go away. *Env Health Perspectives* 105:1284-1287. 5. Needleman HL et al. 1996. Bone lead levels and delinquent behavior. *JAMA* 275:363-369. 6. Canfield RL et al. 2003. Intellectual impairment in children with blood lead concentrations below 10 µg per deciliter. *N Engl J Med* 348:1517-1526. 7. Selevan SG et al. 2003. Blood lead concentration and delayed puberty in girls. *N Engl J Med* 348:1527-1536. 8. Hu H et al. 1996. The relationship of bone and blood lead to hypertension. The Normative Aging Study. *JAMA* 275:1171-1176. 9. Heaney RP. 2000. Lead in calcium supplements. Cause for alarm or celebration? *JAMA* 284:1432-1433. 10. Jacobs Starkey L et al. 2001. Food habits of Canadians: comparison of intakes in adults and adolescents to Canada's Food Guide to Healthy Eating. *Cdn J Diet Pract Res* 62:61-69.



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Positioning of Both Dental Hygiene and the Dental Hygienist

by Susan Ziebarth, CHE

Position yourself well enough, and circumstances will do the rest.

— Mason Cooley

This issue of *Probe* focuses on ergonomics, an area in the workplace where theory and practice often collide. We see this at first hand when selecting photographs for *Probe*; pictures have been rejected because the dental hygienist is not positioned properly. Teaching ergonomics to dental hygienists is akin to dental hygienists teaching proper oral health behaviours to their clients. Attention to detail can make a significant difference to health.

At the association level, "proper positioning" can acquire a number of strategic meanings but I have one particular meaning in mind as I write this. Dr. Anthony S. Kravitz, president-elect of the British Dental Association, interviewed me in early June as part of a long-term research project he is conducting. This research, entitled "The uses of, and the attitudes towards, dental auxiliaries across the world," is in partial fulfillment of a master's degree at the University of Wales. From his comments, I learned two things that made me think of the "positioning" of dental hygiene.

First, the Canadian Dental Association had completed a survey sent out by Dr. Kravitz and he was seeking confirmation of various facts in their responses. There were significant errors in CDA's replies about dental hygienists. The nature of the errors was interesting and made me question just how much dentists really know about dental hygiene education and the dental hygiene knowledge base.



**Ergonomics,
an area in the
workplace
where theory
and practice
often collide.**

Positionner à la fois l'hygiène dentaire et l'hygiéniste dentaire

par Susan Ziebarth, CHE

Positionnez-vous le mieux possible, et les circonstances feront le reste.

— Mason Cooley

Ce numéro de *Probe* porte sur l'ergonomie, un domaine du milieu de travail où la théorie et la pratique entrent souvent en conflit. Nous en sommes témoins au premier chef lorsque nous choisissons des photographies pour *Probe*; on a rejeté des images parce que l'hygiéniste dentaire n'était pas dans un positionnement adéquat. L'enseignement de l'ergonomie aux hygiénistes dentaires s'apparente à celui des bons comportements de santé buccale que dispensent les hygiénistes dentaires à leurs clients. L'attention portée au détail peut faire une nette différence sur la santé.

Au niveau de l'association, le terme « bon positionnement » peut prendre un certain nombre de sens stratégiques, mais à ce moment-ci, il m'en vient un entre autres à l'esprit. D^r Anthony S. Kravitz, président élu de la British Dental Association, m'a interviewée au début de juin dans le cadre d'un projet de recherche à long terme qu'il poursuit. Intitulée « Utilisations des auxiliaires dentaires dans le monde et les attitudes qu'on leur témoigne », cette recherche constitue une partie de ses obligations de maîtrise à la University of Wales. De ses commentaires, j'ai appris deux choses qui m'ont fait penser au « positionnement » de l'hygiène dentaire.

L'Association dentaire canadienne avait d'abord rempli un questionnaire envoyé par D^r Kravitz, et celui-ci cherchait confirmation de divers faits contenus dans les réponses. Il s'est avéré qu'elles contenaient de graves erreurs concernant les hygiénistes dentaires. La nature des erreurs était intéressante. Elle m'a amenée à me demander à quel point, au juste, les dentistes étaient réellement informés

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Ergonomics and Dental Hygiene

by Ruth Lunn*

"Ow!" Does this sound familiar? Have you ever expressed this upon waking in the morning due to pain in your neck, back, or shoulders? I know I have.

I'll never forget the first time I experienced this. I had been working as a dental hygienist in the beautiful Okanagan Valley of British Columbia for approximately a year and a half. The office where I was employed had a rear delivery system that resulted in consistent twisting of my upper torso to retrieve instruments. As well, my dental chair was fixed and I could not rotate the base, which made sitting past the 11 o'clock position impossible. One beautiful Saturday morning, I awoke with a bit of a sore neck. As the day progressed, my neck became stiffer and stiffer until any movement was completely restricted. This inability to move my neck and the resulting extreme pain was very frightening for me as I had never before experienced anything like this in my life. After a trip to the Emergency, I was placed on painkillers and muscle relaxants and given a referral to a massage therapist.

The massage therapist questioned me about my work environment, my posture while working, and what my exercise habits were. He indicated that my neck problems were directly related to my operatory set-up, operator chair height and positioning around the dental chair, and my working posture. After several not-so-pleasant massages to break down the muscle adhesions and after performing exercises he taught me to improve my posture, muscle strength and flexibility, I started to feel much better. He also provided me with important information on how I could adapt my working environment to avoid the spinal twisting and also how my head and arm position (avoiding the "dental hygiene head lurch" and lowering of my "wings") would reduce my risk of back, neck, and shoulder strain (repetitive strain injury). This incident made me a firm believer in the importance of body ergonomics and the practice environment of dental hygiene.

A few years later, I moved to Vancouver and eventually became involved as a clinical dental hygiene instructor at Vancouver Community College. With my past experience with shoulder and neck pain, I became somewhat of a zealot in regard to the students' posture and positioning. One year,



the students presented a visor to me with "Posture Patrol" written on the front! It was interesting to watch the students as they worked and how their posture would immediately improve as they saw my shoes approach their chair! It pained me (literally) to observe some of the positions the students would get themselves into in order to access various parts of their client's mouth. Some looked like contortionists, sitting at 12 o'clock, right elbow raised to shoulder height, head tilted to their left shoulder, spine

twisted, and torso leaning to the left while trying to access the lingual of quadrant one using direct vision. You can't possibly have a long, injury-free career in dental hygiene with postures like that!

In 1987 I met Dr. Lance Rucker from the Dental Faculty at the University of British Columbia. Dr. Rucker had introduced the concept of Performance Logic into the first year of the UBC dental program a few years earlier. Performance Logic incorporates the principles of body ergonomics not only in client/operator positioning, but also in dental light placement, operator chair height, and instrument/handpiece holding positions. It also includes the operator's use of surgical magnification. This was an enlightening experience for me! During my dental hygiene education, the operator chair seating position was in the 7:00 to 11:00 o'clock range. The concepts derived from Performance Logic indicating that right-handed operators could position themselves as far as 1 o'clock was almost shocking to me! Our faculty ran with this idea and Susanne Sunell and Linda Maschak were integral in adapting and developing these principles and introducing similar concepts for our Dental Hygiene program.

When I would run into former students at various courses or conventions, they would tell me that they often thought of me if they started to get a sore neck or back. (Sometimes I felt like I must have been a real pain!) To me as an educator, it is important not only to teach total client care and competent debridement skills, but also to teach and encourage operator self-awareness and ergonomically safe and correct client/operator positioning. I would express to the students, "I want you to be able to practise not only competently but *comfortably* for a long, long time!"

The idea that a dental hygienist can practise comfortably and injury-free by incorporating the principles of ergonomics, body self-awareness, and exercise to improve core muscle strength and stability is not just a dream anymore; *it is a reality.*

* Ruth Lunn, a 1980 graduate of Algonquin College, has been an instructor in the dental hygiene program at Vancouver Community College for the last 16 years and has practised clinically at the British Columbia Cancer Agency since 1990. Ruth has presented continuing education courses on various topics including body ergonomics and surgical magnification in dental hygiene practice.

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Joanne Clovis, incoming president of the Canadian Association of Public Health Dentistry

On June 22, 2003, Joanne Clovis was confirmed as President of the Canadian Association of Public Health Dentistry (CAPHD).

Joanne Clovis is an Associate Professor in the School of Dental Hygiene at Dalhousie University. She holds a Diploma in Dental Hygiene, a Bachelor of Education, and a Master of Science from the University of Alberta, and a Doctorate of Philosophy in Interdisciplinary Studies from Dalhousie University. Her professional career has spanned a broad range of private practice, public health, public and dental hygiene education, administration, and government consulting. She has published research in scientific issues of *Probe*, in the *Journal of the Canadian Dental Association*, *Caries Research*, *Journal of the Canadian Dietetic Association*, and *Community Dentistry and Oral Epidemiology*. She recently facilitated CDHA's National Dental Hygiene Research Agenda Workshop and was a member of the task force developing the document *Dental Hygiene: Definition, Scope, and Practice Standards*. Her significant contributions to the dental hygiene profession have been recognized with an honorary CDHA life membership and an Alberta Dental Hygienists' Association gold medal for community service.



The CAPHD is a non-profit organization whose purpose is to advance the art and science of dental public health and by its application, to maintain and improve the oral health of Canadians. For more information, please visit their web site at <www.caphd-acsd.org/about.html>.

Resources on second-hand smoke

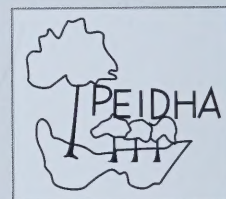
The Canadian Public Health Association project "Respecting the Air We Breathe" is developing messages to encourage parents not to smoke and not to allow others to smoke in their homes or anywhere children are present. CDHA is assisting CPHA to create an inventory of existing resources. If you know of resources developed since 1999 that target parents and include messages to reduce children's exposure to second-hand smoke, please forward them to <library@cdha.ca> or contact Nancy Roberts at 613-224-5515, ext 22, or 1-800-267-5235.

CDHA acts as expert witness

On April 30, 2003, Susan Ziebarth, Executive Director of CDHA, acted as an expert witness at the House of Commons Standing Committee on Health. Her oral presentation focused on First Nations and Inuit oral health issues. It is posted on the CDHA web site at the following address: <www.cdha.ca/content/newsroom/pdf/aboriginal_peoples.pdf>.

Prince Edward Island – Provincial Promotion Report

by Julie Linzel



This year, the Prince Edward Island Dental Hygienists' Association has been without an official coordinator for National Dental Hygienists Week and National Dental Health Month ever since our coordinator became our provincial president.

But this has not stopped us from informing the public of exactly who dental hygienists are. We knew that this period would be a slower time for official group activities planned by our association, so we decided to launch an individual, "on-the-job" promotional campaign. We rounded up some wonderful sponsors, Ash Temple (Bill Tingley) and GlaxoSmithKline (Tim Dixon), and made dental hygiene pins for every registered hygienist on PEI. These colourful pins have our provincial logo, name of the hygienist, and the words "Dental Hygienist" attractively written. All members of our association are encouraged to add the words "dental hygienist" to their name when introducing themselves. They have also been asked to display posters or interesting literature that talks about our role in total dental and personal health care.

This has been well received in our association since we have a very young member base with most members working at least part-time and having young, busy families. As we are a small association, we can promote ourselves collectively all year round rather than having a few people doing all of the work. This period has provided a good rest for all of the hard workers in our association and a good topic of discussion at our meetings—"How did you promote yourself this month?"

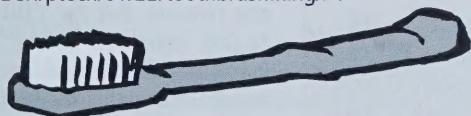
Make no mistake . . . having no official coordinator has not kept us quiet. Our numbers are small; our voice is big.

National Oral Health Strategy

Become involved in developing the National Oral Health Strategy—give your input on the themes or topic areas that will form the framework of the document. The Strategy will consist of measurable oral health goals for the year 2010. The Federal, Provincial and Territorial Dental Directors (FPTDD) have developed five oral health themes: public education and awareness; oral health, and oral disease and disabilities; improving access to care and reducing barriers to oral health care; monitoring, surveillance, and research; and human resources. For more information on the National Oral Health Strategy and to provide your input, please visit <www.fptdd.ca>, or contact Dr. Steven Patterson, Chairperson, Federal, Provincial and Territorial Dental Directors at 780-492-8240.

The lowly toothbrush is the king of inventions

The January 2003 Lemelson-MIT Invention Index indicates that, when Americans are given the choice of which item they could not live without—a toothbrush, computer, car, cell phone, or microwave—42% of adults and 34% of teens cited the toothbrush. For more information, please see the following web site: <www.cnn.com/2003/TECH/ptech/01/22/toothbrush.king/>.



Department of Dental Hygiene, University of Toronto, celebrates its 50th anniversary

The Department of Dental Hygiene at the University of Toronto celebrated its 50th anniversary this spring. While the department turned 50, the university gave Chancellor's medals to university alumni celebrating their 75th, 70th, 65th, 60th, and 55th year of graduation. For more information, please see <www.alumni.utoronto.ca/events/reunion/reunion.htm>.

Canadians are having trouble accessing oral health services

CDHA has published *Access Angst: A CDHA Position Paper on Access to Oral Health Services*. Find out what sections of the population have trouble accessing services, the status of public health, and the systems issues that prevent access. CDHA proposes solutions to these issues in this paper.

First Nations and Inuit oral health

CDHA is looking for individuals who are interested in or who currently work in the area of First Nations and Inuit oral health. We are compiling a list of people to consult on these issues as the need arises. If this is your area of interest, please contact Susan Ziebarth at <saz@cdha.ca>; 613-224-5515, ext 25; or at the toll-free number, 1-800-267-5235.

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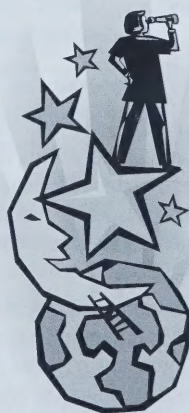
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Membership Renewal Drive 2003–2004

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The CDHA Membership team has already commenced work on the 2003–2004 Membership Renewal Drive, to take place in September. As the only national association for dental hygiene in Canada, the CDHA is dedicated to advancing the profession and protecting the interests of all its members. As a member of the CDHA, you are an important partner in the dental hygiene community; you are part of the collective voice and vision of dental hygiene in Canada!

What does being a partner in the dental hygiene community mean? What concrete benefits do you receive through your CDHA membership? As a CDHA member, you have access to a broad range of benefits, such as:

Meaningful insurance coverage:

Active membership in CDHA gives you the security of knowing you are protected when providing services to the public through liability (malpractice) insurance and disciplinary/sexual abuse defence cost insurance. (Please note that proof of malpractice insurance to the Regulatory Body is required in Ontario, British Columbia, Alberta, and Saskatchewan.)

Membership in CDHA also provides you with access to the diverse insurance products offered through the Canadian Dental Hygienist Insurance Plan (CDHIP). These insurance products include life, accidental death and dismemberment, extended health care, long-term disability and critical illness insurance; commercial general liability (for self-employed members); group home and automobile insurance as well as an RRSP program.

Networking and recognition: Membership in CDHA offers you opportunities for networking and professional recognition. Through events such as the annual conference, national communication campaigns, and National Dental Hygienists Week, you have the opportunity to network one-on-one with other members of your professional association. On-line communication tools and resources, such as "Find a Member" in the Members' Only section of the CDHA web site, let you connect at any time with other members of the dental hygiene community to share common experiences, expertise, and practices. Awards, grants, and scholarships available exclusively to CDHA members recognize and reward those individuals who, through their leadership and dedication, have contributed to the profession of dental hygiene.

Professional development: Membership in CDHA allows you to stay abreast of the latest scientific trends through a variety of forums: workshops and conferences; the CDHA Membership Resource Centre, which offers a broad variety of publications, products, and services to help its members; *Probe*, a professional journal that provides members with the most up-to-date scientific and technical developments in dental hygiene.

The numerous benefits offered to CDHA members makes membership in your professional association an easy decision.

Membership renewal is just around the corner. A personalized Membership Renewal package will be sent in late August to all of our members (except for those in Alberta and Saskatchewan). To ensure you receive your package with the least possible delay, please make sure the CDHA has your current mailing address. You may verify this by logging onto our web site (www.cdha.ca) Members' Only section, where you can manage your own profile on-line. If you do not have Internet access, the CDHA Membership team would be pleased to assist you. Simply call us toll-free at 1-800-267-5235, Monday to Friday, 8:30 a.m. to 5 p.m. ET or leave us a message.

Alberta and Saskatchewan members: Your membership renewal is administered through your provincial associations, the ADHA and the SDHA. Please contact your provincial association office directly for more information on membership renewal in your province.

RENEWAL DATES FOR REGULATORY BODIES

Alberta	November 1, 2003
British Columbia	March 1, 2004
Manitoba	January 15, 2004
New Brunswick	January 1, 2004
Newfoundland and Labrador	November 30, 2003
Nova Scotia	November 30, 2003
Ontario	January 1, 2004
Prince Edward Island	April 1, 2004
Quebec	April 1, 2004
Saskatchewan	January 15, 2004

Timelines

There are some important timelines we would like to highlight to ensure that your membership renewal is as seamless as possible. Please allow 4 to 6 weeks for your membership renewal to be processed after it is received in our Processing Centre. This may seem like a long time to process one renewal. But the CDHA is over 10,000 members strong, and our Processing Centre will be receiving and processing thousands of membership renewals over the period of a few weeks. Therefore do not delay in sending in your renewal. Once it has been processed, you will be mailed a Membership Package containing a

membership acknowledgement letter confirming your renewal, your membership card, and your malpractice insurance certificate. Official tax receipts will also be issued.

Nova Scotia and Newfoundland members: The membership renewal processing timeline is especially important for you because membership is mandatory for practising dental hygienists in your provinces. Your regulatory bodies require proof of membership by November 30, 2003, so please do not delay in sending us your membership renewal.

The chart above outlines the renewal dates for each provincial regulatory body in the country. Please keep these dates in mind, as well as the processing timeline, when remitting your membership renewal.

The CDHA is your professional association. There is strength in numbers! Maintain your membership with the CDHA and provide us with the strength to continue representing your interests and advancing your profession. Be a member of your dental hygiene community—renew your membership with the CDHA. 

Ergonomic Risk Factors

Associated with Clinical Dental Hygiene Practice

by Susanne Sunell, BA, DipDH, MA, EdD,* and Lance Rucker, AB, BDS, DDS, FACD†

ABSTRACT

Posture, positioning, and instrumentation principles have formed an integral aspect of dental hygiene education for years. However, studies continue to indicate that dental hygienists are at risk for developing musculoskeletal problems. The data analyzed from 170 survey respondents from British Columbia indicate that dental hygienists are experiencing musculoskeletal discomfort and pain that they attribute to their clinical work. Statistically significant relationships were found between equipment, posture, positioning, and psychosocial variables, and the incidence of musculoskeletal problems. Recognition of these factors is the first critical step in avoiding or neutralizing ergonomic habits and work environment layouts that might otherwise shorten clinicians' careers unnecessarily.

Introduction

Dental equipment is becoming increasingly sophisticated and the potential for improving the occupational health of dental clinicians has expanded with these advances. However, dental hygienists and dentists still continue to identify chronic neck, back, and shoulder pain as an occupational ailment associated with their professions.^{1,2} Burke, Main, and Freeman found that these problems were often associated with early retirement from the dental profession.³

Most clinical photographs depicting dental hygienists in the professional and popular media betray a continued professional tolerance of imbalanced positioning and compro-

mised postures. This may account for our observation that rehabilitation professionals often conclude dental hygiene practice necessitates ongoing postural compromises such as raised shoulders and twisting of the torso. In reviewing reports from physicians, physiotherapists, and occupational therapists, we have found many who conclude that dental hygienists are unable to continue clinical work, presuming that dental hygiene practice is innately health-compromising.

The issue of musculoskeletal problems continues to plague the dental professions and is rapidly becoming an important professional issue for dental hygienists who wish to continue their dental hygiene career throughout their lives. The literature indicates that both dental hygienists and dentists are experiencing back, neck, and shoulder pain, and that they in many cases attribute these problems to the provision of clinical care.^{4,5,6} Studies in median nerve sensitivity and cumulative trauma disorders of the median nerve also identify dental clinicians as being at risk.^{2,7} Consistent reports of work-related and work-impairing injuries of dental clinicians indicate an average incidence of over 60% of workers who have experienced work loss related to musculoskeletal pain during the preceding year.^{1,8,9}

Many factors—including medical, occupational, and/or lifestyle factors—appear to contribute to musculoskeletal problems. Occupational patterns that seem to be influential include excessive use of small muscles, repetitive motions, tight grips, fixed working positions, raised arms, limited movements, and long-term static load on muscles.^{7,10,11} The exact nature of the relationships between these factors and musculoskeletal problems is unclear.¹²

Dental hygiene education has for many years included posture and instrumentation principles. Many of the periodontal instrumentation books stress the need for neutral wrist positions and criteria for "rock and roll" activation to promote the use of the larger arm muscles. However, many texts continue to contain diagrams of instrument accesses that can be achieved only by raising arms and twisting torsos.^{13,14} However, the literature also identifies a problem-solving model called Performance Logic that is based on individualized positioning.^{15,16} This approach begins with a proprioceptive exercise to determine the operator's preferred posture for physical and visual control of fine motor activity.

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† Director of Clinical Simulation at the Faculty of Dentistry of the University of British Columbia. He has pioneered ergonomic use of dental surgical telescopes, designed equipment layouts to improve ergonomic safety for dental hygienists, and has been an equipment evaluation consultant for major dental equipment manufacturers. He is Councilor and co-founder of the Clinical Simulation Section of the American Dental Education Association. In his private consulting practice, Dr. Rucker works with dental clinics to ensure that they are laid out and used in ways that put dental professionals at minimum risk for work-related pain. <author@lancerucker.com>

It is based on the clinician's individual musculoskeletal requirements and attempts to neutralize the limitations that might be imposed by specific equipment and by habituation from prior psychomotor experience. This approach was investigated and introduced into dental ergonomic education at the University of British Columbia (UBC) in the early 1980s.¹⁷ It was subsequently incorporated into the dental hygiene pre-clinical course at Vancouver Community College (VCC) in 1990.¹⁸

The Performance Logic model helped operators discover new ways to position themselves comfortably and effectively but did not resolve the differences in operators' individual preferences for eye-to-object distances.^{18,19} Operators' visual acuity was frequently not matched to their optimal comfortable musculoskeletal positioning. The integration of surgical magnification systems into the clinical armamentarium was found to be especially effective in supporting operators' angle of vision while maintaining the optimal musculoskeletal operating posture.

While we were able to talk about our experiences and success stories in relation to the Performance Logic model and surgical magnification as well, we did not have sufficient group data to identify factors that might decrease or increase the risk of work-related injuries. The quest for a better understanding of these issues led to this study. We wanted to learn more about the health status of British Columbia dental hygienists and dentists in relation to the types of musculoskeletal discomfort and pain they were experiencing. Our study also looked at practice patterns in order to explore the relationship between these patterns and the incidence of musculoskeletal symptoms (MSSs). We believed this information would be valuable to clinical practitioners, educators, and the rehabilitation community.

Methods

In 1999, a questionnaire was sent to 433 dental hygienists and 975 dentists in British Columbia to find out more about their health status and work profiles. The target sample for the dental hygiene group consisted of the graduates from the three dental hygiene diploma programs in British Columbia for the past 10 years. The dentistry group consisted of UBC graduates for the past 13 years as well as a comparable group of B.C. dentists who had graduated from other dental programs. The study was supported by a grant from the Workers' Compensation Board of BC but was conducted under the aegis of the University of British Columbia.

The surveys consisted of a combination of open-ended and closed-ended questions asking respondents to rate items and to address issues important to the understanding of their work patterns, symptoms, and identified (or suspected) health risk factors. The questionnaires asked respondents for information about their practice ergonomics, practice management issues, lifestyle, and perceived control of their work environment, as well as questions about specific musculoskeletal symptoms (MSSs).

The questionnaire data were analyzed through descriptive and inferential statistics. The analysis included the exploration of relationships between variables such as symptoms,

practice patterns, equipment characteristics, and psychosocial factors. Spearman correlation coefficients were used for ordinal data and chi-square tests were used for nominal data. An alpha (p value) of 0.05 was applied to these tests. It was recognized, however, that the finding of statistical significance does not necessarily imply a difference that is important or meaningful in practice. We therefore searched for patterns in the data to assess the substantive importance of test results.

A total of 170 responses were received from the dental hygienists (39% response rate) and a total of 421 responses from the dentists (43% response rate). This is a respectable response rate but still constitutes a limitation of our study. It could be argued that people with problems may have been more likely to respond. However, this contention is challenged by respondents' characterization of their excellent general health. Feedback from dental hygienists also suggested that the funding link with the Workers' Compensation Board of BC may have influenced their response rate negatively. The study was also based on respondents' self-perception that could have been influenced by a number of variables, including the respondents' ability to understand the subtle differences among the survey diagrams, and their awareness of personal practice patterns. These limitations need to be considered when reflecting on our data.

The idea of discomfort or pain was expressed through nine descriptors including aching, spasm, tingling, numbness, stiffness, weakness, sharp pain, and stabbing pain. Beyond understanding issues of frank pain, we were interested in the more subtle issues of discomfort as portrayed by these descriptors.

Results

Ninety-four per cent of the dental hygiene respondents were female and 68% had been in practice for five or more years. Almost all (95%) worked in general practices and commonly practised seven or more hours per day, with 72% of the respondents practising four or more days per week. Eighty-eight per cent of the dental hygienists practised more than 40 weeks per year. Not surprisingly, given the target group, the respondents were fairly young. Seventy-four per cent of the respondents were 39 years of age or younger and only 24% were older than 40 years. If anything, this would suggest a fairly healthy study group. This is supported by the respondents' subjective ratings of overall health: 80% indicated *good to excellent* overall health, 19% *average* overall health, and only 1% rated their overall health as *below average*.

In spite of this perceived overall positive health status, 86% of the dental hygienists indicated that they had experienced work-related problems within the past year. They identified a variety of localized discomfort and pain that they perceived subjectively as work-related (Table 1). In particular, they noted such symptoms in the neck (80%), hands (75%), shoulders (71%), upper back (64%), and lower back (59%).

Dental hygienists appear to have a greater number of problems as evidenced by the higher percentages of dental hygienists than dentists who reported experiencing discomfort.

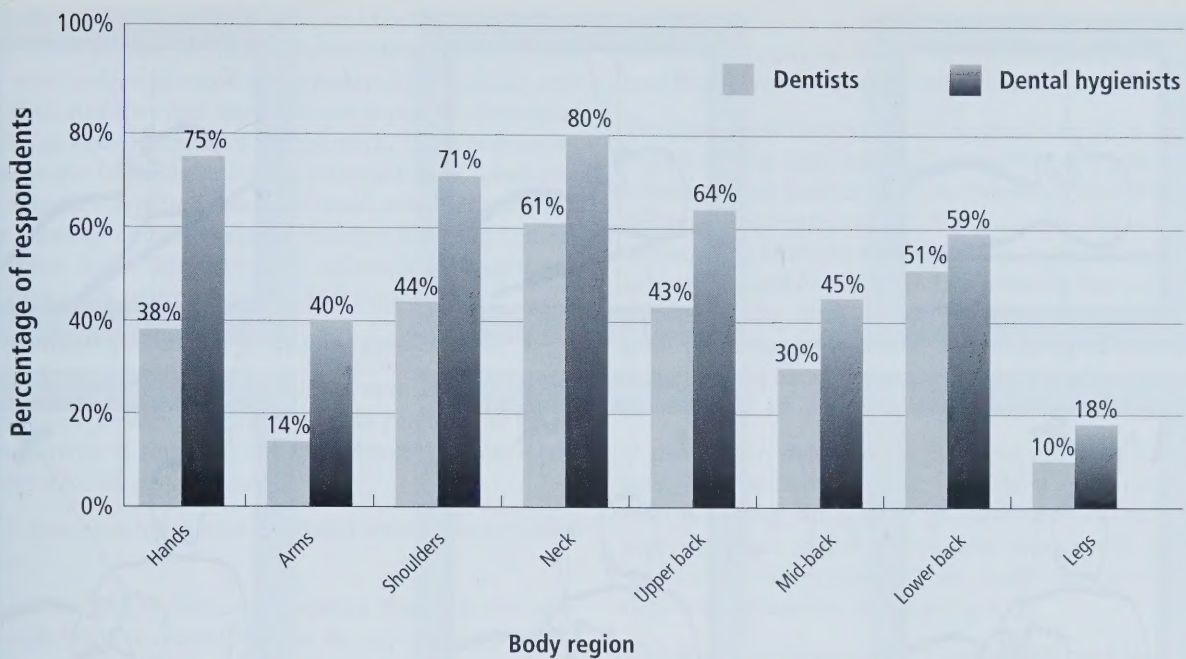


Table 1. Respondents experiencing work-related discomfort or pain during the past year

fort and pain in every body region. Related to this is the perception among 94% of the dental hygienists that their musculoskeletal symptoms were either caused entirely or exacerbated by their clinical work. Only 4% reported that their symptoms were related solely to factors other than their clinical work.

An analysis of the data also suggests that dental hygienists experience a greater frequency of work-related musculoskeletal discomfort and pain than do dentists (see Table 2). While the degree of variance differed for symptoms in various regions of the body, the dental hygiene respondents gave a higher frequency rating in each category.

We also explored the outcome of their work-related problems. Six per cent of dental hygienists lost a total of 30 work-days during the previous 12-month period. While many respondents in our study may not have taken days off work, they did seek help for their problems. Eighty-eight per cent of the dental hygienists and 61% of the dentists had used a variety of strategies and therapies to seek relief from their musculoskeletal discomforts and pain during the past five years. Among intervention strategies, both dental hygienists and dentists perceived the most successful to include increased exercise, change in clinical work habits/postures, heat and cold applications, non-prescription medication, and massage therapy. In addition, dental hygienists also found fewer practice days per week helpful. The strategies perceived as providing "permanent relief" for the greatest number of dental hygienists were increased exercise (13%), change in clinical work habits/postures (6%), and fewer practice days (6%).

Despite the fact that exercise seemed an important strategy to provide permanent relief, fewer than half (46%) of the respondents incorporated stretching exercises into their practice routines. More than half (54%) never performed stretching exercises before starting the workday, and only

10% usually did so. During the workday, 37% never performed even 8-to-10 second stretches, and only 10% did so several times during the day. A disconcerting statistic was that 76% of dental hygienists reported that they just "lived with the pain" (tolerated it).

Equipment and use patterns

We also collected information about equipment and its use. For the purpose of this article, we chose to characterize use of specific equipment for more than half of the clinical practice time as an important part of clinicians' work profile.

Nearly half of the dental hygienists (46%) use adjustable head rests. Almost all use adjustable operating lights (86%) and operating stools whose height can be adjusted in 10 seconds or less (79%). Seventy per cent work in equipment settings where they can position themselves freely around the dental chair.

Body region	Frequency of discomfort and pain			
	Dental hygienists		Dentists	
	Daily	Weekly	Daily	Weekly
Neck	20%	22%	8%	16%
Hands	6%	27%	3%	6%
Shoulders	21%	21%	7%	11%
Upper back	16%	18%	6%	13%
Lower back	15%	12%	6%	11%
Mid-back	14%	9%	5%	8%
Arms	5%	12%	1%	2%
Legs	4%	3%	1%	1%

Table 2. Frequency of discomfort and pain experienced by study respondents

Figure 1. Position of client

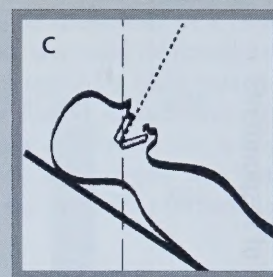
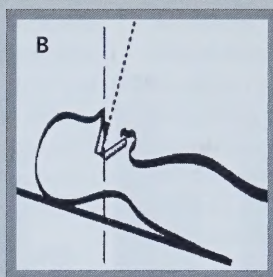
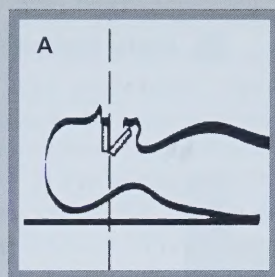
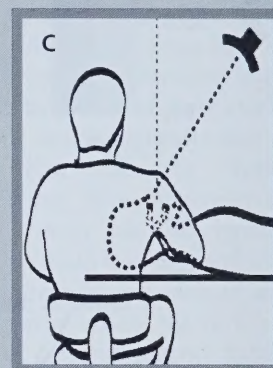
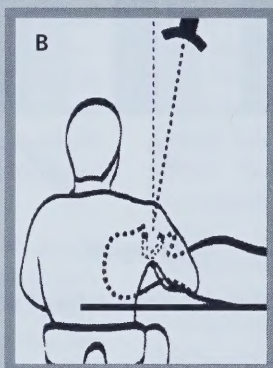
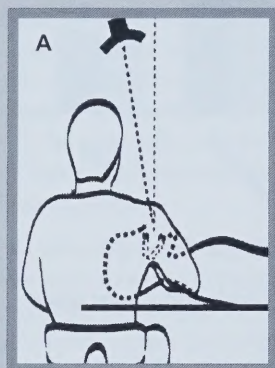


Figure 2. Position of light



Most dental hygienists position their operating stools so their hips are at the same level as their knees (75%) or slightly higher (18%). For maxillary treatment, 77% of dental hygienists position the client fully supine with the maxillary plane approximately vertical (Figure 1A). Almost all (98%) position the operatory light source at increased angles toward the client's feet (Figures 2B and C).

For mandibular treatment, most (78%) use a semi-supine position, elevating the client's head from 15 degrees to 30 degrees to better access the client's mandible (Figures 1B and C). Most place the operatory light source at positions closer to their sightline, at locations further away from the client's feet (Figure 2A).

Fifteen per cent of dental hygienists used surgical magnification systems of some sort. Their experience with these systems was, however, limited. Few of the dental hygienists (6%) had used surgical magnification systems for more than three years.

Posture and positioning profiles

Sixty-five per cent of dental hygienists use intra-oral finger rests for instrument stabilization, and 37% use extra-oral hand rests on clients' faces for stabilization during fine motor manipulations. Slightly more than half of the dental hygienists (54%) position their hands at about elbow height during clinical operation. Some (19%) operate with hands at heart height; 27% operate with hands below the elbows.

Most dental hygienists (77%) report raising their dominant elbows approximately 45 degrees and a few (6%) even as much as 90 degrees. Only 16% do not commonly raise their dominant elbows from a relaxed position at their sides. The data profile for their non-dominant arms is nearly the same (73%, 6%, and 19% respectively). Only 2% of dental hygien-

ists indicated that they never tipped their shoulders to the side during practice, and only 7% reported that they avoided rotation of their trunk relative to their lower bodies during client care.

When positioning themselves around the head of clients, 75% of right-handed dental hygienists use the 7:00 to 8:30 o'clock range, but only 5% use it more than half the time. Ninety-eight per cent of the dental hygienists use the 11:00 to 1:00 o'clock position, with 36% using it more than half of their working time.

Only 22% of dental hygienists keep their legs beneath the client chair during treatment. Forty-four per cent operate with legs split at the head of the client chair, which limits their ability to freely shift position in the o'clocks. Eight per cent operate with legs at the side of the client chair, which requires a torso twist in order to access the client's oral cavity.

Environmental and psychosocial issues

Fifty-five per cent of dental hygienists registered *agreement* or *strong agreement* with the comfort of the temperature in their work environments. Nearly one-third (30%) did not feel that the temperature in their workplace was comfortable. Only half (52%) of the dental hygienists agreed that the air quality in their work environments contributed to comfortable working conditions, whereas 24% were not comfortable with its quality.

Sixty-four per cent indicated that their physical working space allowed them to provide client care with ease, whereas 22% indicated that the working space did not allow for this. Quality of lighting received approval from 83% of the dental hygienists and 72% indicated that the level of noise at work allowed them to provide client care without interruption.

Most dental hygienists (81%) indicated that the people they work with function as a team. Seventy-three per cent said they were comfortable asking co-workers for assistance, and 63% indicated they had opportunities to provide input into the design and organization of their work. Three in five perceived some flexibility or choice over their work schedules, but only 22% reported that they could take breaks during their workday. Only 32% agreed that they had some control over their day-to-day workloads, although 76% indicated that their work environment was well organized.

Correlations of MSSs and positioning profiles

Several statistically significant findings were identified in the correlations between the various practice patterns and MSSs. In the interest of simplicity and clarity, only the *p* values are indicated for all associations.

The following patterns were associated with *decreased* risk of MSSs:

- Increased time with an articulating head rest was associated with decreased MSSs in the upper back ($p=.025$).
- The ability to move freely around the o'clocks was associated with decreased symptoms in the shoulders ($p=.042$), neck ($p=.020$), and upper back ($p=.035$).
- Positioning legs directly under the chair more than 50% of the time was associated with decreased frequency of leg symptoms ($p=.041$).
- The use of surgical magnification was associated with fewer symptoms in the lower back ($p<.001$).

It appears that equipment variables are important in understanding the occurrence of MSSs.

The following patterns were associated with *increased* risk of MSSs:

- Dental hygienists who spend more time practising with their trunks rotated reported increased incidence of discomfort and pain in the shoulder ($p=.019$), neck ($p=.027$), and upper back ($p=.044$).
- Those who spent more time with tipped shoulders were more likely to experience symptoms in the hands ($p=.001$) and arms ($p=.013$).
- The more likely dental hygienists are to raise their dominant elbow, even as little as 45 degrees, the more likely they are to experience MSSs in the shoulders ($p=.003$) and lower back ($p=.049$).
- Dental hygienists who use the 7:00 to 8:30 positions a greater percentage of the time are more likely to experience MSSs in the shoulder ($p=.012$), neck ($p=.001$), and lower back ($p=.013$).
- Increased use of ultrasonic instrumentation was associated with leg symptoms ($p=.013$).

These relationships to various body regions support the multifactorial nature of MSSs.

Discussion

In the oral health field, we have seen much attention directed toward carpal tunnel syndrome as a focus of primary concern vis-à-vis work-related MSSs. The current study has focused on other important areas as well. Dental hygienists

continue to be at risk for a variety of MSSs and it appears that dental hygienists are, in fact, at a higher risk for such symptoms when compared with dentists.

The differences between dental hygienists and dentists with regard to their experiences of discomfort and pain may be related to their practice patterns. Whereas dental hygienists are more frequently involved in a continuity of hand and/or ultrasonic instrumentation in difficult-to-access areas, dentists' work patterns may introduce frequent changes of pace and movement from one operatory to another and/or a greater variation of instrumentation. Gender may also have influenced the data given that 67% of the dentists were male; this might be an interesting area for further investigation.

It also appears that certain equipment and positioning factors place clinicians at greater risk. Many of the risk factors such as twisting, tipping and raising of arms will come as no surprise; much of this study's data concur with previous studies.^{1,5} However, this study also contributes some unique data to the discussion of ergonomics.

This study's findings suggest several distinct and identifiable factors regarding clinical equipment use and positioning that are associated with **increased risk of MSSs** for dental hygienists. These factors include the following:

- torso twist (Figure 3)
- tipped shoulders (Figure 4)
- dominant elbow raised during operation (Figure 5)
- operatory light positioned away from clinicians' sight-line (Figure 6)
- operating with hands close to face (Figure 7)
- increased time practising in the 7:00 to 8:30 and the 3:30 to 5:00 positions (Figure 8)
- increased use of ultrasonic instrumentation

Self-recognition by clinicians of any of these factors is cause for reflection.

The use of ultrasonic instrumentation was associated with an increased incidence of MSSs in the legs. This may be related to the positioning of the foot pedal or the use of larger foot pedals, both of which can result in imbalanced hip and leg postures.

We found correlations between the use of certain positions around the client chair (7:00 to 8:30, and 3:30 to 5:00) and increased risks for MSSs. This finding may be related to the effects of torso twisting and elbow-raising compromises, given that such positions tend to increase the incidence of twisting and elevation of the arms. However, we did not find any correlation between the 12:00 o'clock position and MSSs. This finding differs from the results of Liss and Jesin² who found a positive correlation between the 12:00 o'clock position and carpal tunnel signs and symptoms. We can only speculate that perhaps the dental hygienists in their study operated in the 12:00 position in an attempt to alleviate the MSSs accumulated through years of working in other positions and/or they may not have had education in the optimal use of 12:00 o'clock positioning, including important aspects such effective instrument grasps, neutral wrists, and the effective use of the mirror.



Figure 3. Torso twist

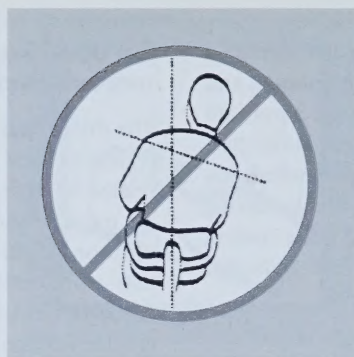


Figure 4. Tipped shoulders



Figure 5. Elbow (either dominant or non-dominant) raised



Figure 6. Operatory light away from clinician's sightline



Figure 7. Hands close to face

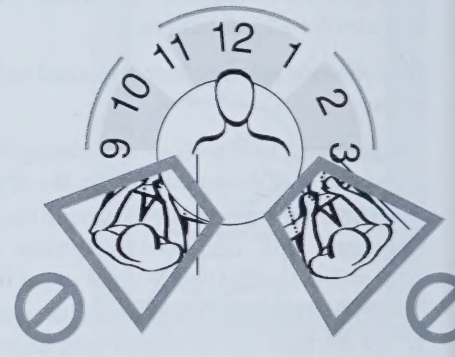


Figure 8. Increased time in 7:00 to 8:30 and 3:30 to 5:00 positions



Figure 9. Light positioned close to clinician's sightline



Figure 10. Elbows resting at clinician's sides

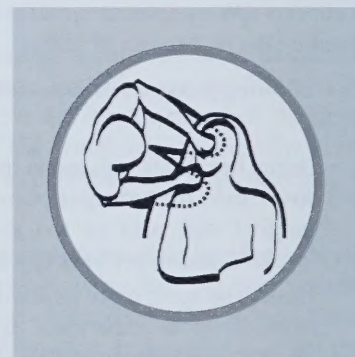


Figure 11. Equipment that allows clinician's legs to be positioned directly under the client chair

The compromising effects of positioning the light towards the clients' feet are probably the result of violations of the physics of light-line and sightline. For optimal illumination, the light-line must be as close to clinicians' sightline as possible (Figure 2A). The greater the deviation of light-line from the clinicians' sightline, the greater the shadowing (Figure 2C). As long as the light-line and sightline are within 15 degrees of each other, the view will be essentially unshadowed and highly visible using standard mouth mirrors.²⁰ Rather than adjusting the light-line towards their sightline, most clinicians will tend to tip or twist to get closer to the light-line. Light positioning is one of the most critical factors affecting the posture of clinicians, but many texts have ignored these principles of physics and suggest light positions that are located towards clients' feet.

The correlation of increased use of surgical magnification with decreased risks for experiencing lower back pain should be considered in the context that most of the users of surgical magnification in the study were VCC graduates with surgical telescopes that allowed for appropriate declination angles to match their optimal working postures. Some systems in use by clinicians today have limited ability to produce optimal declination angles,^{20,21} and the reductions of MSSs for such users may not be the same as those generated in this study. Surgical magnification without balanced positioning may not have the same effect. At VCC, we have now made surgical magnification a requirement for clinical practice based on our experience with magnification systems since 1994 and based upon the results of this study.

Other studies^{13,23} have investigated the relationship between psychosocial factors and musculoskeletal problems, but there are few studies in the dental field²¹ that have looked at this relationship. Dental hygienists and dentists who perceived that they had less control and influence within the practice indicated a greater incidence of MSSs. For dental hygienists, these variables tended to express themselves through an increased incidence of MSSs in the shoulders, neck, upper back, and lower back area. Recognition of the operative psychosocial and environmental factors by all members of the dental office team might be helpful in reducing such pressures on team members, and possibly the MSSs associated with them.

The findings from our study highlight the importance of positioning as well as equipment variables. Certain factors are strongly associated with **decreased risk of MSSs** in dental hygienists and include the following:

- use of an articulating headrest
- operating seats that adjust readily in height
- operatories designed with freedom for clinicians to position themselves in the o'clocks around clients
- supine client positioning for maxillary treatment (Figure 9)
- dominant elbows resting at the clinicians' sides (Figure 10)
- operator light positioned close to clinicians' sightline (Figure 9)
- use of surgical magnification
- equipment that is designed and used so clinicians' legs can be positioned directly under the client chair during treatment (Figure 11)

An increased awareness by clinicians of such factors may lead to healthier practice patterns.

Many factors beyond positioning and equipment-related ergonomic high-risk factors are important elements in dental professionals' exposure to increased MSSs. For example, the study also confirmed health factors such as increasing age, smoking, and certain pre-existing medical conditions (such as spinal curvature or certain eye problems) as co-factors in higher risk. Likewise, there are fitness factors that seem to be associated with decreased risk of MSSs among dental hygienists, such as increased frequency of moderately paced physical activities and increased frequency of strengthening exercises. Like many health issues, the development of MSSs is multifactorial. No one approach is going to provide a panacea for clinicians.

Many dental hygienists tolerate their pain because they do not know specifically what caused it, much less what to do about it. When many of their professional colleagues have similar musculoskeletal symptoms, the logical conclusion is that such MSSs and their sequelae are an unavoidable part of the work of the profession. So they often continue to work for their equipment rather than having their equipment work for them, and the cycle thus continues. They may also be avoiding issues within the psychosocial domain, not realizing that these factors may be contributing to their physical discomfort and pain.

Most of the negative factors associated with MSSs can be reduced, modified, or eliminated from practice. Most of the positive factors are elements that can be learned, encouraged, and/or acquired. There is a need to increase clinician awareness of the factors, whether known or suspected, that are associated with MSSs so performer- and equipment-based programs can be introduced for intervention where feasible. Given that this study has relied on clinicians' personal appraisals of their practice characteristics, it becomes somewhat easier to alert the at-risk population than it would be if the observations required external monitoring. Dental hygienists need to assess their practice environments with the same attention and consideration that they give to their clients.

Conclusion

The profession might do well to encourage basic seminar-type educational programs in clinical ergonomics directed toward recognizing, intercepting, and reducing identified high-risk patterns of work and lifestyle for all members of the dental team. To date, continuing education programs in clinical ergonomics have focused largely on palliative therapy for clinicians who have been injured. Few clinicians with high-risk profiles who are not yet symptomatic have either realized their risk level or been motivated to deal with the issues. The challenge for the profession is to raise the awareness level of the asymptomatic group, making real prevention a possibility.

Research initiatives allow us to define and refine ergonomic competencies for the practice of dental hygiene. This in turn allows professional associations to establish practice standard guidelines, ergonomic accreditation guidelines for educational programs, optimal operator layout designs, and equipment integration guidelines for manufacturers. National and international standards organizations need evidence to drive the specification of designs and manufacturing tolerances that support optimal ergonomics in the workplace.

The findings of this British Columbia study suggest the value of reviewing ergonomic standards for operator equipment in dental practices. Indeed, it is possible to define and test certain basic standards of equipment and layouts in order to minimize the exposure of dental hygienists to work-related MSSs. While prevention and health promotion have been the hallmarks of the dental hygiene profession since its inception, it appears that we have failed to attend to the preventive and health promotion aspects of our own practices.

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An Overview of Ergonomics, Common Injuries, and Prevention



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Introduction

Dental hygienists annually report a high number of work-related upper extremity disorders.¹⁻⁴ These injuries can impact on length of service in the profession and can significantly decrease the overall quality of life. Dental hygienists have the same incidence of upper extremity disorders as industrial or manual labourers.⁴ In a large survey of over 5,000 army dental personnel, 44.8% reported that they had recurring hand problems.²

Repetition, high force, awkward joint position, direct pressure, vibration, and prolonged postures are all associated with musculoskeletal disorders.² Yet these are activities performed by dental hygienists on a daily basis. Ergonomics, the study of work practice, plays a key role in understanding these issues and can help prevent future injury.

The purpose of this paper is to define terminologies, provide a basic understanding of ergonomics as it relates to the practice of dental hygiene, and outline common upper extremity injuries among dental hygienists. It concludes with treatment options and preventive strategies.

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Ergonomics

Ergonomics is the science of fitting both the physical and psychosocial work and the work environment to the individual.⁵ It is the study of the worksite and the ability of the individual to function within that environment. Physiology, anatomy, psychology, engineering, management, and design are all components of the science of ergonomics.⁷

Dental hygiene: an ergonomic overview

Dental hygienists work in a variety of settings, from pediatrics to geriatrics. Consequently, job tasks can range from those of clinical-based practice to preventive education and administrative duties. The focus of this paper, however, will be on the clinical skills that place stress on the upper extremity.

Skills performed routinely by dental hygienists include removal of soft and hard deposits, stains, and plaque from the teeth through the use of hand and/or ultrasonic instruments; examination of mouth, gums, head, and neck for any abnormalities; exposing and processing x-rays; fluoride treatments; preventive education; administrative tasks such as scheduling appointments, maintaining equipment, and assisting the dentist. Individually, any of these tasks can place the upper extremity at risk for a musculoskeletal disorder;⁶ combined, they play a contributing role in the high prevalence of dental hygienist injuries.

Good ergonomics in the workplace is essential and there are several "at-risk" areas of dental hygiene work to consider: positioning of the upper extremity, speed of muscle contraction, force required, length of shift, and years of practice.

Positioning of the upper extremity. Dental professionals are required to assume static positions for a lengthy period of time while manipulating fine instruments. This often places the trunk muscles (the shoulder in particular) in a position

of stabilizing the body. Concurrently, dynamic fine motor skills are often required to complete the necessary dental work. Awkward positions are therefore assumed trying to obtain an optimal view of the mouth while keeping the patient comfortable. This is no simple task, especially when carried out in a seated position over an 8-hour day. It can place the neck and shoulder muscles under maximum tension. By altering the body position, the wrist and hand can be forced into an extreme range of motion. If the wrist is placed in flexion greater than 45 degrees, compression of the median nerve is possible. This can lead to carpal tunnel syndrome.⁶

Speed of muscle contraction: Specific dental tasks should require fewer than 30 strokes per minute (spm); a stroke rate greater than 30 spm will impact on joints and tendons and will contribute to muscle fatigue. In 1998, Bramson et al. videotaped seven dental hygienists during a typical workday.⁸ Specifically, tasks that were monitored included probing, scaling, polishing, and flossing. High frequency activity (> 30 spm) was observed in all activities.

Force required: One of the hardest tasks performed by dental hygienists involves the removal of calculus from teeth. The heavier the tartar, the greater the force that is required by the hygienist. Bramson et al. reported that 50% of the appointment time is spent on scaling.⁸ A caseload of many patients with heavy calculus with few rest breaks can potentially lead to future injury. Åkesson et al.⁹ used electromyography (EMG), inclinometers, and electrogoniometers to quantify the workload in the neck and upper extremity of female dentists. They found that the trapezius muscle bilaterally had high demands placed on it. Finally, Öberg et al.,¹⁰ using a portable EMG with 10 dental hygienists, found that the trapezius muscle did not show signs of adequate rest between activities during a typical workday.

Length of shift and practice years: Length of working shifts, treatments administered, and the number of years as a dental hygienist can play a role in injury. Lalumandier et al.,² in a large survey, reported that the most significant risk factor for carpal tunnel syndrome (CTS) was the number of patients with heavy calculus who were treated by the dental hygienist.² Åkesson et al. found that hygienists had an increased risk of developing an upper extremity disorder and that this may cause early selection out of the profession.¹¹

Musculoskeletal disorders in dental hygienists

Commonly reported dental hygiene musculoskeletal disorders include; tension neck syndrome, shoulder impingement, thoracic outlet syndrome, pronator syndrome, lateral epicondylitis, de Quervain's disease, and carpal tunnel syndrome.⁶

In 1995, Liss et al.³ in a cross-sectional survey study of 2,142 Ontario dental hygienists and 305 dental assistants found dental hygienists were 5.2 times more likely to be told that they had carpal tunnel syndrome. They also had 2.5 times more wrist/hand injuries, 2.8 times more shoulder involvement, and were 1.8 times more likely to have neck problems. Stentz et al.¹² in a cross-sectional study (n=260) found that 61% of dental hygienists reported altered sensation in the

upper extremity. Further, 81% of respondents reported pain in one or both shoulders and 62% had experienced neck pain in the previous 12 months.

From the current literature, dental hygienists are at risk for developing musculoskeletal disorders, especially affecting the upper extremity. Although factors outside of work can impact on risk of injury, Ylipää et al.^{13,14} found that musculoskeletal disorders are more influenced by physical job tasks and less by active leisure and psychosocial work factors.

More research in this area is important. In the current body of knowledge of dental hygienists and workplace injury, the majority of research has been cross-sectional. The cross-sectional design is excellent at generating questions and theories, but there are very few large longitudinal prospective studies in this area to provide strong evidence. The value of the latter design is immeasurable (albeit costly and time-consuming). By following a larger sample of the population over time and comparing it with a control group, an accurate probability of risk is possible.

Common injuries

Cumulative traumatic disorders (CTD), repetitive strain injury (RSI), repetitive trauma disorders, work-related musculoskeletal disorders (WMSD), and overuse syndrome all describe a common injury that affects the musculoskeletal and neurological systems and results in pain and dysfunction. Performing activities repeatedly without the necessary breaks or at a level too high for the body can cause injuries. The reasons for the occurrence of these injuries can be related to the workplace and the tasks, to intrinsic factors within the dental hygienist, or to a combination of both these circumstances. Common injuries found among dental hygienists include carpal tunnel syndrome (CTS), wrist and shoulder tendinopathies, and hand-arm vibration syndrome. The next section will highlight these three areas. Table 1 gives a summary of the three common upper extremity injuries experienced by dental hygienists.

Carpal tunnel syndrome

Prevalence of carpal tunnel syndrome (CTS) among dental hygienists is reported to be high. Previous studies have shown rates ranging from 3% to 8.4% using a case definition of CTS and/or confirmation by nerve conduction velocity tests.^{1,4} However, this number can increase to 42% or higher if reported by symptoms alone.⁴

In a 2001 survey of over 5,000 army dental personnel,² several key points were highlighted. First, dental hygienists were second only to dental therapy assistants (DTA) with regard to the most-reported cases of hand problems and carpal tunnel syndrome. Second, age was an important factor. Dental hygienists in this study who were over 45 years of age experienced more problems. Third, dental hygienists who had been practising longer than 10 years had an increased risk of developing problems. Finally, heavy calculus also played an important role. When more than half of their caseload were patients with heavy calculus, the hygienists were 2.3 times more likely to develop CTS.²

INJURIES	PREVALENCE	PRESENTATION	DIAGNOSIS	TREATMENT
Carpal tunnel syndrome	3% – 8.4% ^{1,4}	Pain, numbness, and tingling in the thumb, index and middle fingers, and half of the ring finger.	Signs and symptoms; nerve conduction studies	Resting splint, positioning the wrist in 15 degrees of extension, maximizing the size of the carpal tunnel. Postural and ergonomic adjustments.
Tendinopathies	23% ⁴	Localized pain that is reproduced with palpation of the tendon or by activating the muscle that attaches to the tendon. ⁴	Signs and symptoms	Brace or cuff to unload the affected tendon, then strengthening exercises.
Hand-arm vibration syndrome	Prevalence of symptoms: numbness, 94%; white fingers, 38% ²⁰	Decreased hand strength, tremor, and pain in the hands and neck; blanching of fingers. ²⁰	Signs and symptoms	Decrease or stop vibration exposure. Postural and ergonomic adjustments.

Table 1. Summary of common injuries for dental hygienists

Carpal tunnel syndrome is characterized by pain, numbness and tingling in the thumb, the index and middle fingers, and half of the ring finger. It is caused by compression of the median nerve in the carpal tunnel located in the wrist. Often the first signs are night (or nocturnal) numbness. The spectrum of symptoms ranges from the initial tingling to complete muscle atrophy, when the nerve has been affected for a long period of time. Diagnosis is usually made on history and provocative testing and is confirmed by nerve conduction studies (NCS).

The carpal tunnel is a unique area of the body. The roof of the tunnel is created by the transverse ligament as it attaches to the palmar side of the carpal bones. Contained within the tunnel are nine flexor tendons and the median nerve. The space is limited so any increase in structures can impact on the median nerve. Reduction in cavity size can be caused by fluid retention (as during pregnancy), a thickening of tendon structures from repeated trauma, or with an inflammatory response following injury.

Initial treatment usually involves a thorough evaluation by a physical therapist or certified hand therapist to highlight the main problems. The person may be required to wear a splint at night to protect the median nerve. Exercises may be prescribed to address edema, weakness, and or tightness within the limbs, neck, or trunk. A worksite assessment is often warranted to ascertain any ergonomic issues.

Tendinopathies

Although tendonitis is the word most commonly associated with pain and limitations of the tendons, it may be a misnomer. Epicondylitis, supraspinatus tendinitis, and de Quervain tenosynovitis are common diagnoses seen by therapists in clinical practice. Traditionally, these symptoms have been viewed as an inflammatory process and treated as such. Tendinitis is defined as an acute inflammatory response to tendon injury with classical signs of heat, swelling, and pain and therapy is usually directed at reducing inflammation. More recently, histopathological examinations of the affected tissues¹⁵⁻¹⁷ suggest that a non-inflammatory process is present. There is degeneration of the connective tissue. This pathology is called tendinosis. Tendinosis is a break-

down of collagen due to aging, microtrauma, or vascular compromise. Although it is difficult to distinguish clinically between the two diagnoses, current research¹⁵⁻¹⁶ suggests that a true tendinitis is rare and tendinosis is the condition that is treated in most cases.

For the dental hygienist, the problem areas are at the wrist and elbow. Werner et al.,⁴ in a cross-sectional study of dental hygienists, found there was the same risk for upper extremity tendon injury among dental hygienists as there was in a group of industrial workers (furniture, automotive, and manufacturing) where heavy work is present. The risk for hygienists was double that of clerical workers.⁴

Treatment of tendinosis varies. Since the basis of tendinopathies is the degeneration of tissue, patients need to be educated on several key points. Patients should be introduced to the term “tendinosis” and educated on the meaning of degeneration, the length of the healing process, and a realistic, appropriate recovery timeline. Because tendinosis results from failure of tendon cells and collagen, clinical experience suggests that deloading the affected tendon through biomechanical correction may be an important part of therapy. Braces and cuffs are likely to play a role in biomechanically unloading the tendon. If *appropriately prescribed*, they can decrease the load on the tendon and therefore may reduce symptoms. Finally, the role of strengthening should be considered in managing tendon injuries. Historically, eccentric loading has been shown to assist at various sites (e.g., patellar, Achilles, lateral elbow tendinopathies) and the principles outlined by Fyfe and Stanish¹⁸ and by Stanish et al.¹⁹ have provided a foundation for tendon rehabilitation.

Hand-arm vibration syndrome

Using hand-held vibration tool devices in the practice of dental hygiene can cause problems.²⁰ This is called hand-arm vibration syndrome and is characterized by vascular (intermittent blanching or whitening of the fingers), neurological (pins and needles, paresthesia and numbness—similar to CTS), and musculoskeletal disorders. Although most previous studies have focused on male-dominated vibration injuries, women are also at risk.²⁰ Bylund et al.,²⁰ in a study

investigating women who had reported an injury related to hand-arm vibration, ranked dental hygiene as the occupational group with the highest prevalence of injuries. In this study, the relative risk for a dental hygienist to have a vibration injury was 680 times that of administrative personnel (who had the least reported injuries).

Other factors appear to be important in hand-arm vibration syndrome. In a study that looked at the effects of hand-arm vibration on vascular and neurological symptoms, after the use of vibratory tools was stopped, non-smokers had a higher rate of improvement or total relief of symptoms compared with smokers.²⁰ Bylund et al. reported that a majority of the dental hygienists who had vibration injuries were still working but on a part-time basis.

Dental hygienists' job tasks in their daily practice require the use of vibration tools for plaque removal and polishing. The clinician should be aware of good body mechanics, in particular, keeping a neutral posture during the operation of vibration tools. Keeping the wrist at 15 degrees of extension optimizes the space within the carpal tunnel to allow the movement of the median nerve and all nine flexor tendons. Rest from vibration tools may be recommended.

Ergonomic preventive strategies

Dental hygiene uses prevention as one of its core practice skills, yet only 4% of all dental hygiene schools in the United States employ someone with an ergonomic background to be on the teaching staff.²⁰ As discussed, prospective longitudinal studies on this population are rare. More research is needed to look at dental hygienist practice over time, especially in the face of ever-changing technology and practice patterns. Nonetheless, some practical suggestions to consider follow, divided into three sections dealing with posture, work process, and work environment. Table 2 summarizes key strategies to help reduce work-related injuries for dental hygienists.

Posture

Most hygienists' work consists of sustained awkward postures while accessing a small area (oral cavity). Postures may need to be maintained for 30 to 50 minutes, depending on the procedure performed. The clinician engages in scaling, probing, and polishing techniques while assuming a static

posture. All techniques require the use of hand-held instruments with relatively small diameters, varying in size from 1/4 inch to 5/8 inch. Keeping the body in a near-neutral posture during job tasks can prove difficult, especially when faced with prolonged procedures such as heavy calculus removal.

The recommended posture for a hygienist includes neck flexion between 0 degrees to 10 degrees with no twisting or side bending; the shoulders should remain in a relaxed position at the side, elbows flexed and level with the patient's mouth. The low back should be supported with the legs slightly apart and turned out to form a tripod position. Feet should be supported on the floor or the stool rung to reduce low back stress. The knees should be even with or slightly below the hips.⁶ The forearm should be in a comfortable position and the wrist in 15 degrees of extension. It is advisable for the clinician to use the least pinch grip necessary to perform the task and to use fewer than 30 strokes per minute. Repetition higher than 30 strokes per minute has been associated with increased risk for developing a musculoskeletal disorder.⁸

Dental hygienists work in a sitting posture for most of their tasks, placing themselves in a 9:00 o'clock position (to the right of the patient). It is advisable to change the position to a 12 o'clock position occasionally, especially when working on the upper or lower front teeth.⁶

Other tips to help maintain a neutral posture include the use of a small mirror and magnifying glass to gain better visual access to the oral cavity. Twisting to reach a patient's chart may be eliminated by using a well-placed table, voice-activated charting equipment, or a dictaphone. An adjustable chair is essential to help support the lumbar spine curvature and to achieve appropriate body positioning, especially when workers share workstations.

Work process

Ylipää et al.¹³ found that dental hygienists who had control over their schedules reported fewer musculoskeletal problems. This may be due to the ability to stagger patients with heavy calculus or the feeling by the dental hygienist that she has control over her work situation.

Öberg et al.,¹⁰ in a study using EMG on 10 practising dental hygienists, found almost a complete lack of sufficient rest

PROBLEM	STRATEGY
Scheduling too many heavy patients consecutively	Patients are usually booked in advance. Alternate different types of procedures. Patients with heavy calculus are rated before scheduling in order to alternate patients who require more work for calculus removal. Divide patient treatment into two sessions.
Chair arm/rests causing problems	Ensure that the chair is adjustable and has arm rests that can be removed or added for each individual and the procedure performed.
Instruments	Employ a regular instrument sharpening routine. Change the grip on the instrument handle to increase the diameter or texture if needed.
Gloves	Ensure that gloves fit properly and are not too tight.
Poor working posture	Do mental checks to self-monitor posture. Take regular breaks.
Overall health	Maintain a healthy active lifestyle outside of work hours.

Table 2. Ergonomic strategies for dental hygienists⁶

breaks while at work. Of particular note was the observation of one dental hygienist. Significant fatigue was noted in the trapezius muscle of this dental hygienist during and following the removal of heavy calculus. EMG signals indicated that it took the muscle two hours to recover from this event.¹⁰ This confirms previous research that demonstrates dental hygiene involves static low-load muscular work.⁸

Interestingly, breaks may not be enough. Work routines and the physical environment need to be considered to prevent future injuries. A varied schedule with strategic breaks is important. Many work-related problems can be avoided by the clinician organizing the day ahead of time, arriving at work 10 to 15 minutes early each day to review charts and preparing mentally for the workday. Sharpening tools during this time helps to increase the efficiency of the implements. A warm-up and stretching routine during this time can help prepare the body for the day ahead. Regular stretching and resting breaks should be worked into the day, between patients and during lunch breaks. Stretching can even be incorporated during patient contact time, while reaching for instruments or during patient education for example.

Work environment

It is essential that the clinician's workstation be arranged to fit the physical stature of each individual, that is, fitting the job to the worker and not the other way around. This minimizes the need to repeatedly reach, twist, or sustain unhealthy body positions throughout the workday. Hand tools should be within easy reach, and the chair should be adjustable. The design of the chair should include a comfortable seat, a supportive back, and some lateral or side stability. Ideally, chairs should support the upper back, lower back, arms, sitting bones, the thighs behind the knee, and the feet. Finally, the chair needs to be adjustable for position changes during treatment sessions. Additional arm supports can be added to the operator's chair for arm support.⁶

Gloves are often ill-fitting and can cause unnecessary pressure in the wrist area. The correct glove size should be worn to avoid cumulative injury to the wrist and hand. Ultrasonic scalers and polishing devices should be tested periodically to ensure they are using the stated frequencies, 25,000 to 30,000 Hz for ultrasonic scalers and 500 to 600 Hz for polishing instruments.⁶

Other factors to consider in the prevention of musculoskeletal disorders in the dental hygienist include activities performed outside of work. The human body is designed to be a mobile unit. Adopting an active, healthy lifestyle outside of work hours encourages the body to regenerate, heal, and relax. A regular exercise regime, healthy diet, and stress reduction are all important factors to consider.

Summary

Upper extremity injuries are common among dental hygienists. Risk for injury may be related to intrinsic factors or extrinsic factors such as type and amount of work and the workplace itself. Ergonomics has a role to play in reducing the risk for injury and suggestions have been made to help the dental hygienist ensure the workplace is healthy.

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Second, Dr. Kravitz had wanted to speak to a representative from the Consumers' Association of Canada during his visit. However, this association did not believe such a meeting would be a valuable use of its time as oral health was not one of its issues of concern.

Dr. Kravitz was surprised at the lack of consumer interest—a sharp contrast to what he would have experienced in England. He commented on the impact that consumers in Britain have had in making dental hygiene services more accessible in that country. This impact is reflected in a broader scope of practice, the ability to work without dental supervision, and the use of the term "professions complementary to dentistry" instead of the now-abandoned term "dental auxiliaries."

Do dental hygienists have a "position" in the minds of the Canadian public? We have received many complaints from our members regarding recent consumer advertising campaigns where the role of the dental hygienist is not recognized. We have informed the companies of our members' concerns. In addition, as the time of writing, three provincial jurisdictions are attempting to increase dental assistants' scope of practice to include scaling. Attempts have been made previously in Ontario and Saskatchewan to add scaling to the curriculum of dental assistants, but in both cases these attempts were abandoned. Since the inception of dental

hygiene, a minimum of 120 hours of intensive pre-clinical training is required to teach students the proper use and positioning of periodontal instruments so tissue is not injured. Furthermore, extensive study is needed to understand the periodontium and to detect subgingival calculus. These skills are not easily attained. Do your clients know what you do? Do they know about the education that prepared you for what you do? Can you and do you tell them?

I would like to commend the dental hygienist of Ms. Bonnie Brown, Chair of the House of Commons Standing Committee on Health. In a recent committee meeting, Ms. Brown spoke convincingly of the valuable role of the dental hygienist. Ms. Brown indicated that the Non-Insured Health Benefits program for Aboriginal Canadians was currently based on a pathological model where the program paid for the ambulance at the bottom of a cliff. She suggested a better approach would be to build a fence at the top of the hill to prevent people from falling in the first place. That fence, she indicated, was the dental hygienist. Ms. Brown's dental hygienist, through her interactions, helped "position" the dental hygienist as that remarkable fence in this legislator's mind! One dental hygienist and one client can make a profound difference in positioning the profession. "Position yourself well enough, and circumstances will do the rest." 🐾

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"AU SUJET DES CAPACITÉS ILLIMITÉES" (suite de la page 147)

connaissions nos limites. Nous devons explorer nos frontières et créer de nouvelles conditions. Je reviens constamment à cette phrase de Charles Ringma. « De nouvelles conditions peuvent être significatives pour générer de nouveaux hommes et de nouvelles femmes, et de nouveaux hommes et de nouvelles femmes peuvent contribuer à créer de nouvelles conditions ». Je rêve de voir les hygiénistes dentaires pouvoir utiliser leur éducation et leur savoir-faire dans une grande variété de milieux de pratique. Ces nouvelles conditions amélioreront non seulement la qualité de vie des Canadiennes et des Canadiens, mais également le recrutement et la rétention de membres au sein de la profession.

Les questions de ressources humaines ont créé une « crise de panique » dans le milieu de travail traditionnel de la santé buccale. Il devient de plus en plus évident que certains services d'hygiène dentaire sont davantage appréciés que d'autres lorsqu'une crise économique survient. Tant qu'une auxiliaire dentaire peut détartre les dents, il semble que ce soit tout ce qui compte. La qualité des soins semble devenir insignifiante sous l'angle du « problème de pénurie ». Cette confrontation avec la réalité nous pousse à adopter une attitude proactive, à définir pour nous-mêmes notre identité professionnelle et à ne pas laisser d'autres le faire à notre place. Nous sommes capables d'être des entrepreneurs. Nous sommes capables de travailler en

collaboration dans une grande variété de milieux de pratique. Nous pouvons devenir des éducateurs et des chercheurs. Nous pouvons être des agents de changement. Ou nous pouvons être des auxiliaires. Je ne crois pas que les Canadiens aient besoin de plus d'auxiliaires. Ils ont besoin de professionnels de la prévention proactifs, qui militent en faveur d'une amélioration de l'accès aux services préventifs de santé buccale.

Le besoin d'un meilleur accès aux services préventifs de santé buccale pour les Canadiens peut sembler accablant, mais de nombreuses personnes dévouées travaillent déjà à la réalisation de ce rêve. À la fois les membres et le personnel de l'Association ont travaillé avec diligence pour créer des normes nationales pour l'éducation, l'accès et la réforme législative au moyen de politiques écrites, de documents, de mémoires au gouvernement; également, par la participation à des comités clés mandatés pour être des agents de changement. Le dévouement et

la vision de gens d'un océan à l'autre ont amené notre profession à évoluer progressivement. Et les visionnaires de l'avenir poursuivront le rêve.

Pour finir, je vous laisse une dernière pensée : nos capacités ne sont limitées que par notre volonté d'explorer les possibilités. Explorez, et que l'inspiration vous touche !

On peut joindre Karen Wolf au <president@cdha.ca>. 🐾

Nous représentons

un élément très

utile de l'équipe de

santé buccale tout

comme de l'équipe

de soins de santé

dans son ensemble.

Interview with

Mai Pohlak,

DipDH, BA, MEd, DipGrt

by Dennis Jones



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The foremost role in my teaching career has been the development of students' credentials." That's how Mai Pohlak sees her contribution to the dental hygiene profession. Even a brief sketch of her many years of service, though, shows that she is entirely too modest about her achievements. Never ceasing to follow her own paths to learning, she has constantly striven to pass that learning on to the students under her care.

Ms. Pohlak began her career in 1960, only nine years after the first dental hygienist was licensed in Ontario. After working in orthodontic practice, she spent a year in public dental health. She then went to the University of Toronto's Faculty of Dentistry, where she not only taught but also served as the clinical director of the dental hygiene program. In 1963 she and other University of Toronto alumni of the School of Dental Hygiene were instrumental in establishing the Canadian Dental Hygienists Association (CDHA), and Ms. Pohlak served as the CDHA's first president.

She was already becoming an educator and mentor. Beginning in 1963 she developed and taught a pilot course in dental assisting for the Scarborough Board of Education concurrent with obtaining her secondary school teacher's certification. When Ontario community colleges began offering dental hygiene and dental assisting courses in 1975, Ms. Pohlak's commitment to personal learning had already earned her a BA in psychology. This opened the door to teaching at Seneca College, where she worked both as a coordinator and a teacher.

After completing yet another degree, this one a Master of Education, she joined the University of Toronto's Faculty of Dentistry as Coordinator of the BScD(DH) program. In this position, from 1981 until her recent retirement, she worked not only to advance the professional education of dental hygienists, but also to develop the continuing education programs that have become part of the quality assurance program for graduate dentists. Along with all this, she still found time to establish a course in the treatment of aging dental patients, to participate in the Task Force on Dental Hygiene Education and to assist in the creation of a dental hygiene program in Estonia.

We spoke with Ms. Pohlak about her career, about the steady progress of dental hygienists toward full professional recognition and about the path she believes the profession will follow in the years to come.

Q: You've worked in the dental hygiene profession since 1960. How is the profession different now from the way it was when you began?

When I began, caries were very prevalent and dentists badly needed help in preventive therapy. Things have improved, although we still haven't eradicated dental caries by any means, nor gingivitis or periodontitis or the many other oral diseases. But we have far better educated and knowledgeable

dental hygienists now. That is, they're not generalists but rather oral health care providers and preventive therapists. So the training is far more specific than it used to be. And in the past decade the profession has become self-regulating, so

our responsibilities for our own practices have become much greater. I think those are perhaps the main differences.

Q: It wasn't until 1950 that Canada had its first registered dental hygienist. In those early days, how were dental hygienists perceived by others in the oral health care profession?

The other oral health care professionals were dental nurses, as they were called until the late 1950s, and of course dentists. I think the dental hygienists were so badly needed that the dentists were extremely happy to employ them, to get the load a bit lightened in the area of oral hygiene. When they were introduced, the problem was perhaps more with some of the public, who thought, "No, no, I would like to see a dentist. I don't want anybody else to look in my mouth." But that was overcome very quickly by the support of the dentists, so it was not really a problem, at least as I saw it.

Q: Since that time, how has the perception of the dental hygiene profession changed, both among oral health care providers and among the public?

I believe that people now expect to see hygienists working both in dental offices and in public health. They are very well-received in the schools and in the educational area in general, where they provide information on oral hygiene and preventive care.

Q: You have always been a leader in your profession. How did this come about, and did you plan for it to happen?

Here I have to clarify my role somewhat. In 1963, right after I became the president of the Canadian Dental Hygienists Association, I started teaching high school, where I pioneered a program in dental assisting for girls in grades 11 and 12. At the time, things like electronics were available for male students, but there was nothing for female students and they needed something. My background came in handy, and I became a high school teacher for 13 years, teaching dental assisting. I established two such programs and that took up my energy almost totally. So you can understand why I did-

n't have much time, for a while, for the development of the dental hygiene profession itself.

In the beginning, creating the high school programs was not entirely what I'd planned. At the time I was director of the dental hygiene clinic at the University of Toronto, but teaching happened to be an interesting alternative for me. So I said to myself, "Well, why not change my career?" And I was also working on my BA, and that turned out to be useful in my preparation for high school teaching.

Later I discovered that the community colleges were going to have dental hygiene and dental assisting programs. So I planned my education further, and while I was teaching at Seneca College from 1975 to 1981, I took my master's degree. That was very useful when I changed positions and became the director of the BScD(DH) program at the University of Toronto. By then I was very interested in getting dental hygienists into education and other fields in the profession, and certainly that happened with my graduates from the BScD(DH) program. But I think I'm jumping ahead a little into the educational issue.

Q: Let's talk about the educational side of things, then. Since you entered the profession, there have been major changes in the way dental hygienists are trained. Can you give us a sketch of the key events along that path?

First of all was the development of dental hygiene programs in 11 to 13 different institutions in Ontario. Now we also have private schools. Another was that the role of the profession was very much clarified—professional standards were set, and there was a rush of setting objectives, as they were called at the time. Establishing these learning outcomes made the educational program very, very specific. It became almost an individualized pact between the student and the institution—you will learn, and then we will test you, and if you succeed you will get your certificate or your diploma. So the way that people were trained became extremely precise.

Q: You were in charge of the BScD(DH) degree at the University of Toronto after the diploma program was transferred to the community colleges. What led to the university's decision to move from a diploma to a degree?

Well, that was actually very simple. Undergraduate diploma programs ceased to be offered at the University of Toronto, just as with physiotherapy and occupational therapy. Dental hygiene diploma programs had already gone into community colleges, and there was sort of a trade-off there. The colleges needed qualified teachers, and the BScD program was already in existence—it was open to dentists, for them to take dental public health, for example. And so there was a convenient opening for dental hygienists to enter a degree program, and it became the BScD(DH) degree.

Q: During that transition, were there difficulties as well as successes?

There weren't really any difficulties because it wasn't a transition—it was a brand-new program related to dental hygienists in the teaching profession or in public health. So it did not further education in dental hygiene per se, but it provided hygienists with a wonderful opportunity for devel-

oping in those two areas. So the entry level was different—you needed a community college diploma in dental hygiene, and you also needed to have completed one year of a university program. In fact, the earlier University of Toronto diploma program in dental hygiene satisfied the university requirement very nicely, because it gave many credits toward the first year of any science program. So anyone with a dental hygiene diploma from the University of Toronto could enter the BScD(DH) program, if they so wished. I guess the unfortunate thing was that not too many wished, so we didn't have too many applicants.

Q: As you've indicated, after the establishment of the degree program, the applicant pools were quite small. How did you manage to keep the program viable?

Well, the answer to that was easy because it wasn't a program only for dental hygienists. In fact, we were told not to have more than six successful applicants per year, or otherwise they would overwhelm the classes where we had dentists taking the diploma in public health, for example, or students studying periodontology. In other words, we didn't want to flood the classes with dental hygienists, so the enrolment was intentionally kept low. And most dental hygienists made excellent salaries and were very happy in their profession as they were. That meant the program attracted unique individuals who had the future in mind and who wanted to do something further with their diploma. Adding a degree was exactly what they needed, and these wonderful people later became the leaders of dental hygiene. And they still are.

Q: In the larger perspective of the past 50 years, how would you describe the changes in education that the profession has undergone?

In the 1960s many other universities opened schools of dental hygiene—the University of Manitoba, the University of Alberta, Dalhousie University in Halifax, and the University of British Columbia. That placed a rush of new hygienists on the market, so to speak, who were very well trained. And again I have to emphasize that the training is now very specific. We have standards of practice for the profession, which the community colleges are following. And as I said, they are creating a pact with the individual who comes into the institution to study for a diploma in dental hygiene.

Q: In 1963 you were instrumental in establishing the Canadian Dental Hygienists Association. You, indeed, were its first president. Can you describe why and how you went about creating a national voice for the profession?

The history of this began at the faculty of dentistry at the University of Toronto. Only six or eight people graduated from the first year of the diploma program in 1953, and even by 1955 there were only 20 or 25 in all. However, we created an alumni association for dental hygienists and then began to look into creating a national association as well. We worked very diligently together, with help from accountants and lawyers, to develop the organization. It flourished because the other universities were also graduating dental hygienists by that time, and that gave us the critical mass that we needed to bring together hygienists from across the country.

Q: What do you believe has led toward the fuller professional recognition that dental hygiene has achieved over the past decades?

For all professions, both continuing education and a connectedness with local, provincial, national, and international associations are very important. I think that dental hygienists recognized these facts very quickly, especially at the teaching level—that you needed to communicate and clarify the profession's educational requirements, not just to keep them uniform but also to make it portable, so that you could travel and set up practice in other provinces. We all saw the value of unification, communication, and standardization, so the standards of practice were developed very quickly. Marnie Forgay, who was the director of dental hygiene in Manitoba at the time, was very influential in achieving that.

Q: How do you think dental hygiene can move most effectively toward recognition of full professional status?

I see any profession as having a mass of research behind it, research in very specific areas. Dental hygienists are just barely developing this because we don't have many PhDs in the discipline. I think we need to train more dental hygienists to the master's and PhD level, so that they can do research on issues related to oral health care and the prevention of oral diseases.

For example, we need our own master's program, most likely connected to a faculty of dentistry. I also see it connected with nursing, if possible, because they have a master's program and a PhD level program at the University of Toronto. It has taken them many years to develop these programs, but I think it's very necessary to have that kind of background and information available to dental hygienists and to the profession as a whole. So we need the support of all dental hygienists in recognizing that we do need programs of our own, programs to deal with current issues and problems of dental hygiene. Such issues and problems should be fully researched, and the results published as educational material for future generations of dental hygienists.

Q: In the opinion of some, dental hygiene has an image problem—is it a technical vocation or a profession? What do you envision as the ideal image for dental hygiene in the future?

I don't see it as a technical vocation, very definitely not. I don't actually think that dental hygiene has an image problem at all, if one recognizes that we are health care professionals, although we still have to work very hard within our own ranks at advancing the profession.

Q: The Canadian health care system, given the Roy Romanow report on the future of medicare, seems on the verge of considerable change. Do you see opportunities here for your profession?

I can see dental hygienists working in clinics together with other health care professionals, almost in a consulting way. I think that we should have perhaps not walk-in clinics, but something like that, where people could go for consultation and be educated about what they need. I do not know if there could be government funding for dental hygiene, but I would hope so.

Q: Staying with the prospect of change in the health care system, how do you see your profession meeting the challenges that may arise?

I think that we have excellent leaders both in the Canadian Dental Hygienists Association and in the provincial associations. These have a stethoscope on the health care system, and we also have people who participate in policy changes to the system. As long as we keep in touch with exactly what is happening, educators will be well informed as to how quickly they need to deal with these changes. That's important because the changes have been yearly if not monthly. But I think the schools are responding beautifully to them.

Q: The Canadian population, as everyone knows, is becoming older. How do you think this will affect the work of dental hygienists?

Becoming older does not really mean that there are different dental hygiene problems. Dental hygienists have been asking for the ability to contribute to institutionalized elderly populations, but because of provincial regulatory barriers we cannot work within our scope of practice without the dentists being involved in some way. So it has become difficult to provide the care that our profession sees as needed in those institutional settings. However, I think that for a healthy, elderly person there's no difference in treatment from when they were younger.

Q: Given the demographic and policy changes at work, do you think there will be enough dental hygienists to meet the demand on the profession?

Well, it seems that whenever somebody sees a need, we have a private institution developing. So I have a feeling that we will have enough hygienists. Also, we have dental hygienists trained in the States who come back to Ontario to take the licensing exam and practise in Canada. I don't think there will be any problem with meeting the demand.

Q: The profession has met and overcome significant challenges in the past. What do you see as the biggest challenge facing the profession today?

To have more autonomy over our practice. I think our standards are already very clear and very specific, and we are a self-regulated profession. Autonomy seems to me to be what we have to work at, so that we can have alternate practice settings for which we can be responsible. But that does not mean we should be overlapping in any way with the responsibilities of dentistry.

Q: What do you see as the CDHA's role in meeting future challenges?

The CDHA has done very well in publicizing changes and in developing standards of practise for the whole nation, so I think they're meeting the challenges as they arise.

Q: What advice do you have for those who will lead the profession in the future?

To stay involved, to stay connected with the associations. There could even be more done at the alumni level—I believe that the community colleges do not have alumni associations yet. I think dental hygienists ought to support and insist on the development of master's and PhD programs for themselves. Perhaps we could also develop more support for those who would like to continue at the PhD

level and master's level without relying on corporate support for their education. That support has been wonderful, but I think that as dental hygienists we could contribute to bur-saries or something of that kind—perhaps many of them, hopefully one in each province each year. But that hasn't quite happened yet.

Q: As was said earlier, you've been deeply involved in the profession for a long time. Would you do it all over again?

It has worked for me because I educated myself along with practising the profession, so that I was able to move around in a most interesting way. And for that reason I'm very happy that I did both simultaneously, education and profession, so they became intertwined. So yes, I could do it all over again. For me it has really worked and I have been very happy and interested in what I was doing.

Q: To conclude, what advice would you have for those working in the dental hygiene profession now, and for those who may be thinking of entering it?

For people in the dental hygiene profession now—they

should take careful stock of how they practise and why they practise, and also assess themselves according to the standards set for dental hygienists. They should examine very carefully what they can really do best for the public.

And there again, the interaction with the public is the most important thing. The client is very important. I think you really have to scrutinize yourself carefully—what am I doing, where am I going, why am I doing this with this particular client or patient?

And for future hygienists? As with all professions, before entering it try to find out as much as you can about it. Look at the different settings for dental hygienists. Go and visit them and observe. And not only that, have different options open to you, and by all means develop the other side of your life. If you're interested in music, don't drop it; if you're interested in the arts, don't drop them; if you're interested in reading, continue. All these are important in making an individual an interested and interesting human being, and therefore someone who is able to care for other people as well. 

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"POSITIONNER À LA FOIS L'HYGIÈNE DENTAIRE ET L'HYGIÉNISTE DENTAIRE" (suite de la page 153)

de l'éducation dispensée en hygiène dentaire et de la base de connaissances de l'hygiène dentaire.

Ensuite, D^r Kravitz avait voulu s'entretenir pendant sa visite avec un représentant de l'Association des consommateurs du Canada. Mais cette association ne croyait pas qu'une telle rencontre serait une utilisation pertinente de son temps, comme la santé buccale n'est pas un de ses domaines de préoccupation. D^r Kravitz a été surpris du manque d'intérêt du consommateur, — en contraste marqué avec ce qu'il aurait rencontré en Angleterre. Il fit des commentaires sur le rôle des consommateurs anglais relativement à une plus grande accessibilité de l'hygiène dentaire. Cet impact s'est traduit dans l'élargissement du domaine de pratique, la capacité de travailler sans être sous la surveillance d'un dentiste et l'usage du terme « professions complémentaires à la dentisterie » au lieu du terme maintenant désuet d'« d'auxiliaires dentaires ».

Les hygiénistes dentaires sont-elles « positionnées » dans l'esprit du public canadien ? Nous avons reçu de nombreuses plaintes de nos membres concernant de récentes campagnes de publicité où le rôle de l'hygiéniste dentaire n'est pas reconnu. Nous avons informé les compagnies des préoccupations de nos membres. En plus, trois provinces tentent actuellement d'élargir le domaine de pratique des assistantes dentaires pour y inclure le détartrage. On a déjà fait des tentatives en Ontario et en Saskatchewan pour ajouter le détartrage au programme d'études des assistantes dentaires; mais, dans les deux cas, on a abandonné ces tentatives. Depuis le début de l'hygiène dentaire, un

minimum de 120 heures de formation intensive pré-clinique est exigé pour enseigner aux étudiants l'usage et le positionnement appropriés des instruments parodontaux pour éviter de blesser les tissus. De plus, une étude approfondie est nécessaire pour comprendre le parodonte et pour détecter le tartre sous-gingival. Ces compétences ne sont pas faciles à acquérir. Vos clients savent-ils ce que vous faites ? Savent-ils quelle éducation vous a préparés à votre métier ? Pouvez-vous les en informer, et le faites-vous ?

**L'ergonomie, un
domaine du milieu
de travail où la
théorie et la
pratique entrent
souvent en conflit.**

J'aimerais féliciter l'hygiéniste dentaire traitant Mme Bonnie Brown, présidente du Comité permanent de la Chambre des communes sur la santé. Au cours d'une récente réunion du comité, Mme Brown a parlé avec conviction du rôle précieux de l'hygiéniste dentaire. Mme Brown a indiqué que le régime des Services de santé non assurés des Autochtones canadiens était basé sur un modèle pathologique dans lequel le régime payait pour l'ambulance au pied d'une falaise. Elle suggéra que ce serait une meilleure approche que de commencer d'abord par construire une clôture au sommet de la montagne pour d'abord empêcher les gens de faire une chute. Cette clôture, indiqua-t-elle, c'est l'hygiéniste dentaire. Par ses interactions, l'hygiéniste dentaire de Mme Brown a contribué à « positionner », sous les traits de cette remarquable clôture, sa profession dans l'esprit du législateur ! Une hygiéniste dentaire et un client ou une cliente peuvent faire une profonde différence dans le positionnement de la profession. « Positionnez-vous le mieux possible, et les circonstances feront le reste. » 

A Canadian Hygienist in Turkey

by Wendy Taylor

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"Imagine a world with no hygienists..." This is a foreign concept for us as hygienists because then the prevention side of dentistry would surely be lacking. On the other hand, however, I am certain some of our patients would think it was great! No lectures, no scaling under local, no anxiety.

This was the situation I discovered when I arrived in Turkey a year ago and started my quest for employment as a dental hygienist. With 14 years of experience and a diploma from Dalhousie University, I thought, "This will be a breeze." However, after talking to a civilian dentist, I discovered that hygiene positions simply do not exist in dental offices. Furthermore, there isn't even a word in Turkish for dental hygienist. The closest approximation is *disciyim*, which roughly translates as "I do the dentistry of teeth."

Why was I in Turkey? Well, in February 2002, my husband (an officer in the Canadian Army) called me at work to ask if I would be interested in moving to an exotic and exciting foreign country. I of course said, "Sure, why not!" but then had to look at an atlas to see exactly where Turkey was.

I liked the fact that Turkey is considered part of the Eastern Mediterranean. However, during our first winter, we had a couple of snowstorms, one dumping about 20 centimetres of snow. Good thing I packed the snow shovel! It took a while to become familiar with the geography of the area as well as the varying climate.

With my high hopes of finding a job dashed, I accepted the only offer I got—as a volunteer at the local British International School giving presentations to the junior and senior high school students for their "Life Class." My 14 years' experience was as a dental hygienist and I found it

nerve-racking to stand in front of 33 teenagers one day and 42 the next. My knees were actually shaking.

**I find myself
constantly
amazed by the
beauty and
history of the
land, the
generosity of
its people, and
the vastness of
its resources.**

Approximately half the students at this school were Turkish, so I felt it best to explain what hygienists are, where they can be found, what plaque is and the destruction it can cause, as well as basic home care instruction. With the older students, I left an information sheet on how to contact ADHA and CDHA for additional information regarding hygiene as a career choice.

The school was in the process of organizing career information sessions/presentations for the most senior and graduating students. A person already working in a field would talk about their personal experiences in the area. This program has not started yet but I hope it will soon.

In order to maintain my "hands-on" skills, I contacted the chief medical officer at the NATO Military Headquarters where my husband is employed. My key interest was

in finding out whether there were any employment opportunities in the dental department of the combined military dental medical facility. Captain Ahmet Atalik (the head doctor) was very interested in having an "information-sharing" session between his medical/dental staffs and myself.

So keen was I to maintain my professional skills that I made an offer to Captain Ahmet to volunteer my time at Headquarters. We drew up a six-month Dental Hygiene Program/Proposal that was presented to, and approved by,

the Turkish Commander of the NATO Headquarters. We reached an unusual compromise. I would set up a program that would include not only the information-sharing sessions, but also a screening process for the officers and their families. This screening would encompass a hygiene maintenance program with detailed charting for everyone.

Captain Ahmet believed that a presentation on basic oral hygiene care at home and the most common issues of oral hygiene home care could be given to the Turkish Military personnel and their families. An invitation might also be extended to the international personnel and their families. In addition, Captain Ahmet and I both believed there might be an opportunity to address the civilian Turkish dentists. This presentation will likely be postponed until the fall of this year due to upcoming military activities. This delay is a good thing—I will have more time to prepare!

At present, I generally spend each Tuesday and Friday afternoon exchanging information on dental-related issues, as well as the differences/similarities between Canada and Turkey, with Captain Ali Layik and Lieutenant/Doctor Erhan. Doctor Erhan and I are also setting up the groundwork for the hygienist/dentist relationship with which we are all familiar by treating the oral health issues and concerns of the military personnel of both Turkey and the international community. We will also be treating their families in the near future. These afternoons are enlightening for me, in both the dental and lifestyles areas.

As a Canadian hygienist, I was interested in knowing what comprises the average diet in Turkey. This consists of meats (no pork), vegetables, fruits, grains, and dairy products. As Turkey is surrounded by the Black Sea, Sea of Marmara, Aegean Sea, and the Mediterranean, fish is also a very important staple in the Turkish diet. To fully appreciate the variety of food items, I enrolled in a Turkish cookery course, an experience that can be summed up in one word—delicious!

There were seven other women in this Turkish cooking class and together we represented Great Britain, the Netherlands, and Canada. We became schooled in the making of mezes (appetizers), stuffed vegetables, and desserts made with mouthwatering sauces or syrups. This was a great opportunity to learn more about the Turkish diet, to see a new area of Istanbul, and to meet other members of the international community.

The kebab is an important and very common part of the Turkish diet. The most common type is the ground meat kebab that is normally served on flat bread with grilled vegetables, rice, and a yogurt sauce on the side. My favourite type of grilled meat is the “donor sandvic” (donor sandwich) made with chicken or beef grilled on an upright spit or skewer and then placed in a sandwich with French fries, choice of tomatoes, lettuce, onions or grilled vegetables. The small grilles or bufe with slowly turning spits are a common sight on the streets of Istanbul and outlying villages and towns.

Of course, no meal is complete without a dessert. My favourite is baklava, paper-thin pastry sheets that are brushed with butter and folded and then layered with ground pistachios or walnuts with syrup poured over it all.

To whip up any of these Turkish “delights,” you will need to make a pit stop at a local market. I generally visit a market or *pazar* every Tuesday and Thursday to purchase fresh fruit, vegetables, cheese, “knock off” clothing, pashminas, jewellery, and even everyday knick-knacks. I quickly learned to barter—asking the price, then offering about 50 per cent, hoping in the end to get about one-third off. I can only imagine the chaos that would ensue the first time if my husband started doing this at Canadian Tire back in Canada.

I learned some Turkish in order to get along in day-to-day life; English is not widely spoken. The Turkish language is a mixture of French, German, and Arabic influences and although I am taking language classes, it is still a challenge to get my message across. But I am practising and hope to improve!

Our next-door neighbours suggested that, in the first year, we concentrate on the “please’s” and “thank-you’s” and basics like numbers, colours, and how to ask for directions. I have a decent collection of words and phrases. My problem is trying to get the Turkish people to speak slowly enough to allow me to pick up those key words I need to comprehend the sentence.

Turkey is a fascinating place. Istanbul was not only the capital of three consecutive empires—Roman, Byzantine, and Ottoman—but also was and is the gateway between two continents, Asia and Europe. With approximately 15 million people, it is a metropolitan city with a wealth of history stored in palaces, mosques, and numerous historical sites and monuments.

I recently visited the southwestern area of Turkey and the ancient city of Ephesus. Here, the early Christian evangelist Paul is believed to have preached in the Grand Theatre that can seat 24,000. Artemis, the patron goddess of Ephesus, was the goddess of prosperity, fertility, and the protection of nature. The Temple of Artemis within the city walls is believed to have been built in the fourth century BCE (before the common era) and is considered one of the seven wonders of the ancient world. Ephesus was an impressive site, leaving me agog.

I will admit that the prospect of moving to Turkey was scary. As a woman, I had reservations about living in a Muslim country but these concerns quickly disappeared. I live in a cosmopolitan area of Turkey where it is common to see women dressed much like they would be in Canada, and enjoying many of the same social activities.

I find myself constantly amazed by the beauty and history of the land, the generosity of its people, and the vastness of its resources. I am one-third through my three-year stay in Turkey and have no regrets whatsoever about moving here. However, I am a Canadian at heart and when the time comes, I will be ready to move back home.

For those interested in helping to educate the Turkish dental professionals and the public on the importance of dental hygiene and its issues, contact me by e-mail at <nixontaylor@mailpuppy.com> or by regular mail at Yaprak Mah, 12 Caddesi 1 Sokak No. 21, 34450 Zekeriyakoy, Istanbul, Turkey. 

Bad Backs **AND** Repetitive Strain

by Peggy McCann, BSc, MA*

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Bad backs, sore necks, pain, and chronic fatigue are common complaints heard in the dental community. These problems impact productivity, accuracy, consistency, job satisfaction, and morale. They are also the reasons given by many professionals as they leave the field completely or reduce their days/hours of work to fewer than they would prefer.

Considering the amount of discomfort and pain related by dental practitioners, relatively few back claims are being accepted by workers' compensation boards. One reason is that cumulative stress on the back resulting in low back pain (LBP)

is not categorized as an injury (i.e., it is not due to a single over-exertion accident). Therefore, at present, this type of slow-onset back trauma is not recognized by most provincial worker compensation systems. Getting any kind of back claim through the system becomes time-consuming and often demoralizing. Until many more group studies are carried out in the dental profession to firmly establish a direct link from job tasks to these types of injury, claims will continue to be ignored.

Claims are recognized, however, for cumulative stress in the upper extremities such as wrists and hands. In large part, this is due to the fact that many other professions in addition to dental hygiene involve repetitive handwork (typists, musicians, assembly line workers, etc.). Hygienists and dentists can share research, resources, and claims management information with them. But regardless of sta-



Figure 1. Student with excellent form: body and head centred, shoulders relaxed with elbows close to the body, good client positioning.

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tistical findings or diagnosis-and-acceptance outcomes of a WCB claim, when large numbers of professionals experience similar physical discomfort and symptoms, these complaints are *real*.

Is there a higher incidence of problems today among dentistry workers than there was 20 years ago? The profession began a strong push for more formal ergonomics training in dental college programs when research studies on occupational risk began to proliferate during the past 15 years. This prompted suppliers to manufacture a wide variety of newer and better instruments (grips, shapes, weights, balance points, etc.), more efficient operator design, adjustable equipment, and better lighting. So why is more heard about these problems now?

A focus on ergonomics

The main reason more is being heard from dental professionals—and from hygienists in particular—is that hygienists are hurting, they are getting angry, and they are becoming quite vocal about it. Finally! Change, either in the individual or the profession, rarely occurs until recognition of the problem reaches critical mass.

Hygienists are speaking up about their needs in scheduling workloads and time, looking at better equipment and operator design, and starting to examine their own work habits and personal lifestyles. Most fully expected their careers to last for their lifetime but are “burning out” more quickly than they anticipated. Some are angry. Their younger counterparts appear to be paying attention and learning from the stories of their mentors.

Some of the ergonomic problems experienced by hygienists are outlined in other articles in this month's *Probe*. This article will mention only a few statistics that prompted my interest in the issue and led to my work starting in 1994 with the Association of Dental Surgeons of British Columbia and in continuing education courses with the Camosun College Dental Health Education Centre.

In the early 1980s, research focusing on occupational risk and reoccurring patterns of musculoskeletal symptoms proliferated. Öberg found that long-standing static contractions of the arm, shoulder, and neck muscles inherent in performing their work appeared to be the main cause of pain among hygienists. Over 62% of the hygienists in Öberg's study reported significant neck pain, and 81% had complaints about one or both shoulders.¹

In a similar study in the United States, Osborn found that musculoskeletal pain, predominantly in the lower back, neck, and shoulder, was reported by 68% of the hygienists in a one-year study. Of these, 34% said the pain interfered significantly not only with their personal lives, but also in their clinical practices.²

Over 30% felt pain in the right shoulder, while 16% noted problems on the left side. Most hygienists are right-handed, which would explain the ratio difference. A senior hygienist/instructor told me about the rehabilitation she needed for the frozen shoulder she incurred on her left side. She said that because she was so concerned with the proper place-

ment of her active hand, she failed to properly monitor her non-dominant hand. This is a classic case of static loading and the silent/stealthy process of cumulative trauma disorders.

In terms of wrist and hand disorders, hygienists win the prize. They perform the highest-risk procedures of hand scaling and polishing: these tasks consist of very controlled, precise, very fast small movements with little rest. It is estimated that a hand scaling procedure consists of almost non-stop repetitive work where there are many short pauses of one to two seconds but almost no pauses lasting longer than five seconds.¹ It is well established that the incidence of carpal tunnel syndrome increases substantially when the fundamental element of work (in this case, precision movements with little range of motion) is performed for more than 50% of the cycle of work.

A high degree of force will increase the risk greatly, as will the position of the wrist when performing the task. A pinch grip, for example, requires five times more force than more relaxed grips. A modified pen grasp used by clinicians is recommended. However, this semi-relaxed grip is frequently changed to a pinch force when they are in a rush, and a 10% increase in speed will cause a 32% increase in pinch force to maintain control.

Excess force and uncontrolled speed affect not only the fingers and wrist, but the shoulders and upper back as well. These structures are the stabilizers for the arm, wrists, and hands. When a person works beyond a comfortable range and speed, these muscles are forced to contract very strenuously to maintain control.

It was noted that the incidence for all musculoskeletal disorders in the dental profession is greater for women than men, at a ratio of 3:1.³ This has profound implications for dentistry offices because 98% of hygienists are women. Physiologically speaking, women generally have smaller joints, less muscle strength, and more hormone fluctuations to influence this statistic.

Stress also plays a big factor in these injuries and hygienists do not always have complete control over time or scheduling factors. As well, everyone has to contend with expanding knowledge and newer techniques, their own aging and the aging of clients, shared workspaces and/or older operator design, and perhaps part-time jobs at different locations to make up a weekly schedule.

The pain of paying out considerable sums of money is another real incentive to focus on ergonomics. Approximately 99% of Canadian dentists are self-employed; most hygienists are not. However, both groups pay for their own medical and disability insurance. Many also pay a significant amount to others to counteract the stress symptoms felt on the job. In countries with state-run facilities, the injury rate for dentists and hygienists is much higher than in North America. Perhaps the main difference between these dental professionals and those in North America is that getting ill in North America affects the personal pocketbook! The onus for staying healthy and fit for a lifetime of work truly becomes the responsibility of each dental worker. *Prevention* becomes the important goal.

Probably the best reason for making changes is that clinicians are getting older. Age seems to act as an impetus to improve skills, fitness, and wellness but it also necessitates change. All of a sudden, eyeglasses are needed, and those over-the-counter readers are traded in for progressive lenses. Pretty soon scopes, which everyone thought a luxury for the rich, are almost a necessity. Aches and pains that used to be worked out with a few quick stretches now linger, and the “everyday body” begins to look like the “job body.” An analogy can easily be drawn to upgrading software: users have no interest in changing unless it affects them in their work. But now that new upgrade is necessary. Age is changing the dental profession and this change is actually a good thing.

Musculoskeletal injuries

The two most common types of injuries for dental professionals are back injuries and disorders of the wrist and hand. Workers' compensation boards refer to the latter by several names: musculoskeletal injuries (MSI), repetitive strain injuries (RSI), cumulative trauma disorders (CTD), activity-related soft tissue disorders (ASTD), and work-related musculoskeletal disorders (WMSD). The wear-and-tear effect of repetitive actions over time generally cause these disorders (discussed in more detail in “Dental Hygienists and the Workplace” in this issue of *Probe*). The two types of wrist/hand RSIs include the following:

- *Nerve compression* (such as carpal tunnel syndrome), generally caused by direct pressure on a nerve
- *Tendonitis*, generally caused by friction (this category includes all the “-itis,” meaning inflammation, such as tendonitis, tenosynovitis, bursitis, and epicondylitis)

Provincial workers' compensation boards and OSHA (Occupational Safety and Health Administration) generally lump all back injuries into a separate “back” category and refer to these as “over-exertion injuries.” In heavy industry, these are usually strains and sprains, generally resulting from a catastrophic accident that can be seen and verified. (“When Ted picked up the log from the truck at 8:10 a.m., he slipped, twisted, and fell to the ground.”) However, this type of incident actually accounts for fewer than 4% of all back injuries.

Most workplace “back injuries” are really not injuries at all but are episodes of low back pain resulting from a slow and gradual decline in the structures of the back. It is a fatigued back trying to do the work, i.e., there is a sustained effort without adequate time for recovery.⁴

Most back, neck, and shoulder injuries—and certainly the ones most common to dental professionals—result from repetitive work and the accumulation of trauma it can induce. This plays a major role in the degeneration of the discs and micro-tears in muscles, ligaments, and tendons. Because few, if any, back or shoulder injuries in hygienists are due to a catastrophic accident that can be seen and verified, how does one prove the injury happened at work when there is no specific moment that requires an ambulance?

Rather than spending time fighting the compensation system, it is better to focus on what individuals themselves can do to prevent injury. The following statistics are sobering but may also provide inspiration. Unfit people sustain back

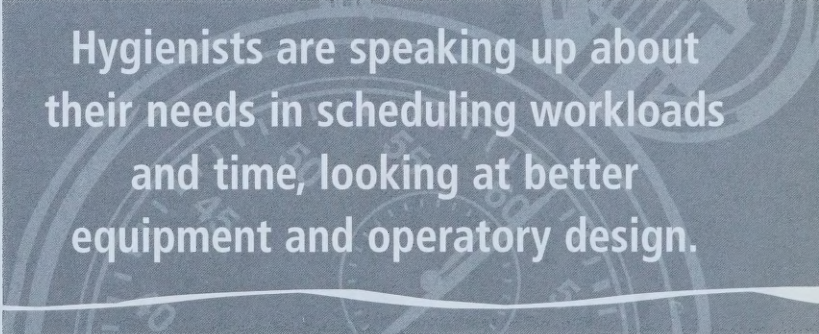
injuries at 10 times the rate of fit people, and 80% of people who have experienced a back injury will have a recurrence within the first year.⁵ If they have suffered two injuries, the odds are 10 times higher they will get hurt again. It is important to remember that back pain cannot be “cured” and relapses are common. Although experts say back pain cannot be cured, it *can* be controlled. Individuals must change what they can in their personal health and life environment as well as the issues at work that trigger these episodes.

Anatomy 101

The bones (vertebrae) that make up the spine are stacked one on top of the other, separated by spongy discs that act as shock absorbers. The three natural curves of the spine—at the neck, middle back, and lower back—align these vertebrae with their discs. When the curves are maintained, the spine easily supports the weight of the body and helps absorb the shock as the person sits, works, and moves.

The effort to keep the spine vertical comes from the muscles and ligaments in the back and abdomen—much as guy wires hold up a radio tower. If one side is used more often, the muscle fibres on that side will contract or become shorter than the opposite side, which in turn stretches. Both sides are forced to work harder as they struggle, not only against gravity but also against each other, to keep the body upright. Muscles become weakened from this chronic strain and weak muscles have a tendency to go into protective spasm when they are chronically fatigued.

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Hygienists are speaking up about their needs in scheduling workloads and time, looking at better equipment and operator design.

Personal risk factors

A quick look at any first-year hygiene class will likely reveal several exceptional students who seem to be “naturals” in the operatory. From the beginning, they radiate health and confidence and have little difficulty finding and maintaining good work postures. (See Figure 1.) They also seem to work at a pace and flow consistent with good body rhythms. When questioned, they mentioned sports, dance, and even piano lessons during their early years, and they still maintain an active lifestyle. As they move through work and play, they have a good kinesthetic awareness of where they are in relation to the task.

These students already possess the three factors needed to maintain a healthy back for a lifetime: (1) a fit and healthy body; (2) regular physical activity; and (3) a good body alignment at work and in “regular” life. These will help to mitigate the natural aging processes of the back and the heavy demands placed on it by their new profession.

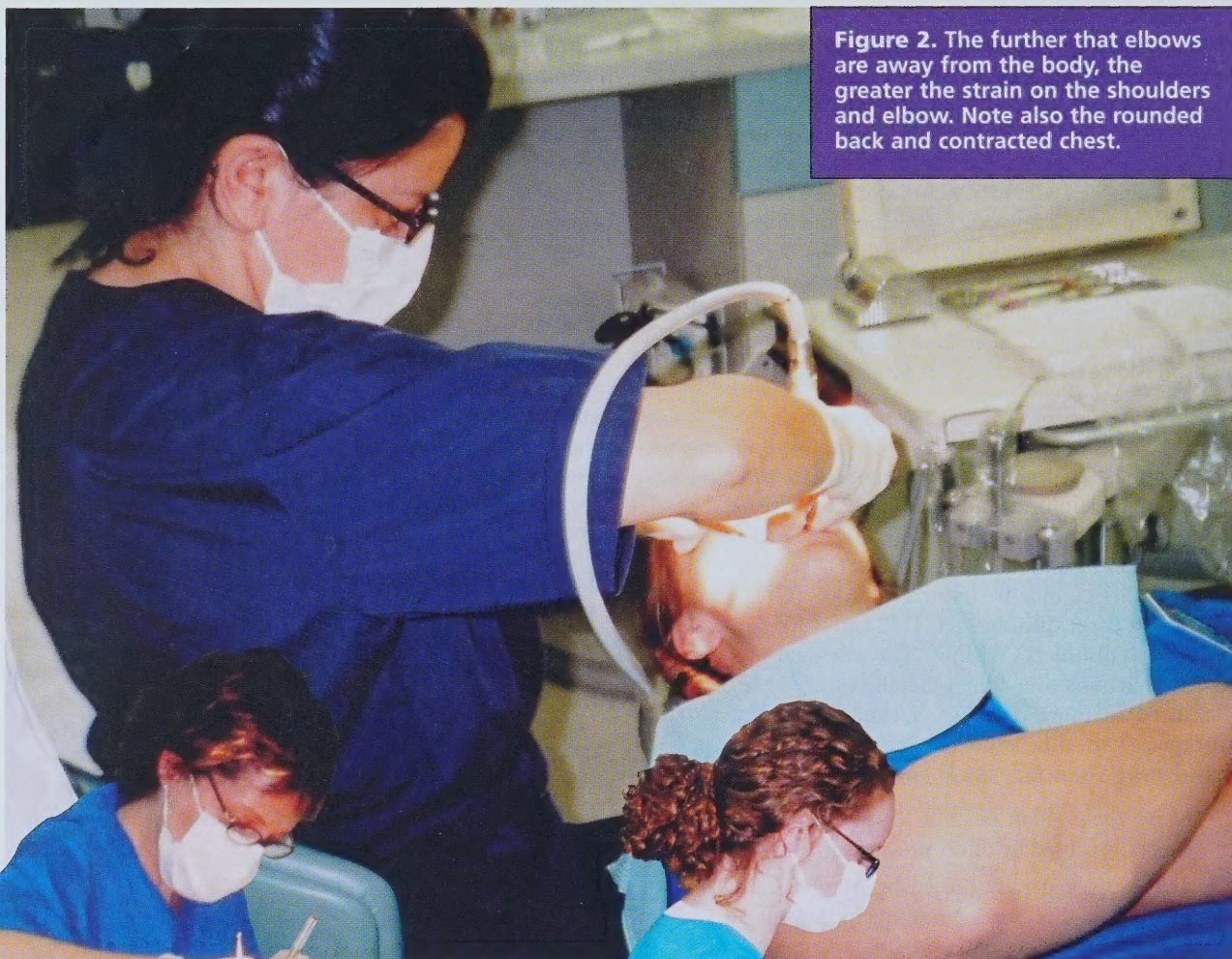


Figure 2. The further that elbows are away from the body, the greater the strain on the shoulders and elbow. Note also the rounded back and contracted chest.

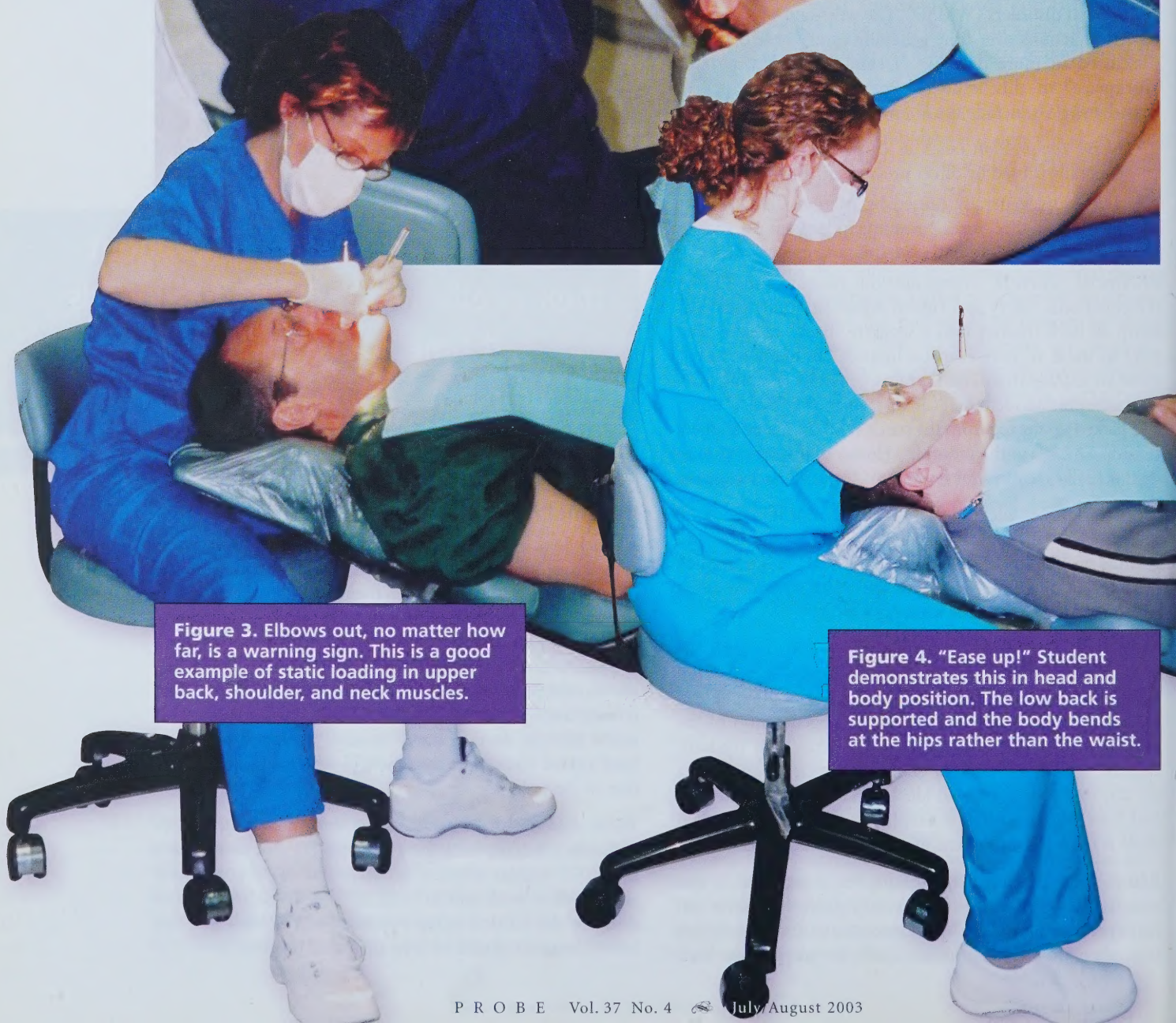


Figure 3. Elbows out, no matter how far, is a warning sign. This is a good example of static loading in upper back, shoulder, and neck muscles.

Figure 4. "Ease up!" Student demonstrates this in head and body position. The low back is supported and the body bends at the hips rather than the waist.

Although everyone must manage the personal risk factors that pre-dispose him or her to injury, Canadian ergonomist Ulrika Wallersteiner is adamant that the majority of risk factors are found in the workplace and in the type of work performed.⁶ It would be interesting to see what WCB requirements a large manufacturing company would have to meet if it had job requirements similar to those in the dental profession.

In evaluating risk in the work itself, there are four key factors that most consultants (including myself) use to evaluate a job: (1) intensity of effort; (2) how often the muscle group gets a rest; (3) how many times the activity is done per minute; and (4) how much work is done during a shift.

Dental hygienists can evaluate their own operatories with these factors in mind. Hygienists are in a high-risk profession and have to balance the risks with excellent personal skills and work habits.

Posture: Mother was right!

Good posture is everything. The lack of it is the root of many of the personal risk factors found in the operatory. Working with the biomechanical principles of good alignment and movement is essential for all practitioners.

Often symptoms are diagnosed and given names of body parts, e.g., rotator cuff disorder. Then just the shoulder is treated without getting to the true source of the problem. A poor alignment contributes to problems in all areas of the body including breathing, digestion, chronic fatigue, mental acuity, etc. The WCB system of separating back injuries from other repetitive strain injuries is just one example of such categorization. It is necessary from a statistical point of view but does not reflect the more realistic and holistic view of how the body works.

The following pages give examples of posture and alignment. These may be elementary for some, but readers are invited to physically try each position as they are reading. As a movement education specialist, I believe it is difficult for most people to truly understand posture (and the results of poor alignment) unless they learn through movement practice. They should continually monitor their posture through self-awareness. This statement appears close to the "Performance Logic"⁷ approach to client and operator positioning.

Breathing — another important part of life

Alignment is a dynamic entity, not a static state, and good muscular effort requires a steady intake and outflow of oxygen and unimpeded blood flow. This brings nourishment and oxygen to the muscles and removes toxic wastes. When performing even the most minimal of movements (which is typical in the operatory), hygienists should keep their breathing rhythmic and strong.

Clinicians should not hold their breath when they need to concentrate. Holding the breath tightens all the muscles in the spine. The shoulders lift and tense, neck muscles constrict, hands grip tighter, and muscular tension constricts the diaphragm. Shallow breathing prompts the same symptoms,

albeit in a slower, more insidious manner. When muscles are deprived of oxygen, they fatigue quickly. Any reduction of oxygen to the brain, which is a muscle, will reduce co-ordination and make thinking difficult.

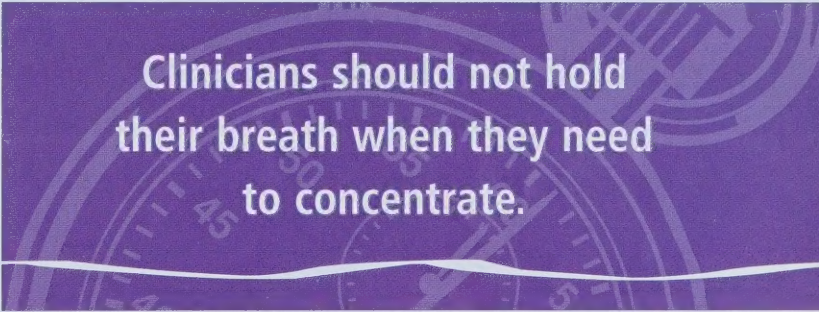
Static loading

The type of tasks carried out by hygienists is unique in that very small muscles do the majority of work. The larger muscle groups in the back, neck, shoulders, and upper arms are basically used to stabilize the joints so the fingers and wrists can do their jobs. (See Figures 2 and 3.)

The work of the larger muscle groups is very intense but does not produce movement. This is called a static or isometric contraction. Blood flow is constricted and therefore less oxygen reaches the muscle fibres. As a result, lactic acid builds up in the muscle and the muscle fatigues.

Static loading is likely the major source of fatigue and pain experienced by hygienists. It becomes worse when the muscles and joints are in poor alignment.

This provides a good idea of the exercise programs that would provide a balance in hygienists' lives. In general, they would want to select exercise and play that use big muscle groups, use a wide range of motion, have a large aerobic demand, and are enjoyable. For improving posture and increasing range of motion, Tai Chi, yoga, Pilates, or any other courses in body wisdom is appropriate.



**Clinicians should not hold
their breath when they need
to concentrate.**

The neutral position

Standing or sitting in a neutral position aligns the muscles in the front and back of the body. The muscles are equal in length and strength, and the body is in optimal mechanical balance. The shoulders are now squared and directly over the hips, and the head is centred and rides easily on the central portion of the neck. How far one deviates from maintaining these curves is proportional to the amount of stress the body will suffer.

In a neutral position, the shoulders allow the upper arms to work within a comfortable range, with the elbows remaining close to the body. The muscles of the wrists, hands, and fingers will be of equal length on both sides of the limbs or digits.

The joints of the body are also at their most efficient when kept in a neutral position. Tendons that operate the joints work best when they can pull in a straight line. Deviations from a straight position leave joints vulnerable to permanent damage. Tendonitis, rotator cuff disorders, and facet joint syndrome in the back are a few of the more common problems that can result from misalignment around joints.

Head and neck alignment — ease up!

Time-motion studies have shown that the head-down position (cervical bending of 45 to 90 degrees) for dentists and hygienists occurs for 58% to 83% of the working day, and a 90% forward flexion is common for many who fail to position themselves or their clients properly.⁸ The head weighs 12–18 pounds, which may explain why neck and upper back complaints are so frequently mentioned.

To help find the best alignment for the neck, readers can try the following:

An imaginary string is attached to the top of the head. Pulling gently will ease the head up and back on its central stalk, the neck. The chin glides in, and muscles on both sides of the neck will return to an even and balanced length as the natural curve returns. The string image can also be used when the head and upper body are bent forward. A verbal cue that may also be useful is EASE UP. The direction “up” refers to the top of the head, not the sky.⁹ The reader can try this by leaning forward and bending the head down. The string should then be allowed to pull the top of the head out and away from the body. That line of direction should be gently maintained as one works. (See Figure 4.)

Precision work demands good eyesight and good lighting.

Beyond the neutral – one is what one does

There are three postures or movements closely associated with back stress—forward flexion, lateral bending, and rotation. Clinicians noted that these are the most common faulty postures they see in themselves and others. These usually happen when they are tired or feel rushed, when they don't want to adjust the client's chair again, or when they just need to “steal a quick peek, just this once.” These “desperation postures” are dangerous to the health. If left unchecked, the work posture often becomes the life posture. Hygienists begin to look like their work!

Muscles and tendons will permanently shorten (or lengthen) to the positions and ranges most commonly used. For example, the two common postures that could become life postures are the following:

- *The Dowager*

Round shoulders and the “dowager's back” happen because the shoulders round forward and hang from the torso. Over time, what starts as a gentle rounding can end up changing the shape of the entire spine.

A work practice that could significantly impact this condition is working with the client at a level that is too low. The clinician's head and shoulders drop and the task of holding up the head becomes the job of the upper back. (See Figure 5.) These muscles increase in

mass as they hold the extra weight, but they will eventually become weak through this static overuse. (The rotator cuff and brachial plexus area can be compromised by this forward position as well. This can have serious consequences for proper nerve conduction to the arms and hands, as well as decreasing shoulder strength and range of motion.)

- *The Vulture*

When the head and shoulders are forward and dropped (the Dowager position), one can't see anything. So the neck has to flex at a fairly severe angle to lift the head in order to see. If the reader tries this, the strain on the neck should be noted and can possibly feel familiar.

- *The Dowager and the Vulture together*

These postures are generally found together and both problems usually start with visual needs. When performing precision work, if the visual field is not in focus, one will do whatever one can to see clearly.

Scopes and lighting

Precision work demands good eyesight and good lighting. The rapid acceptance of scopes by dentists and their increasing use by students in hygiene schools is testimony that they can successfully improve the visual needs of clinicians.

Magnification allows dental professionals to maintain a vertical posture to work and still retain a clear visual field. Scopes are not only for older eyes; they are for anyone where clear vision is a predominant need in their work. Even young eyes may need visual assistance. It has been estimated that dental student errors can be decreased by approximately 50% with the use of scopes.¹⁰

Rucker notes that growing numbers of hygiene programs are recommending surgical magnifiers to their students. He lists numerous advantages for using magnification in clinical treatment and concludes: “The arguments for including surgical magnification ... are similar to the arguments made four decades ago for having air turbine high-speed hand piece technology available in regular clinical practice. The nearly universal response of clinicians who have made this transition (to magnification) is that they would never again choose to practice without [it].”¹¹

Getting older alters most people's ability to see without assistance. Everything changes with age, and clinicians all adapt to and compensate for that reality. Scopes can be one of the most effective tools an older clinician can use to regain the ability to see clearly. (See Figure 6.)

Using scopes is a personal decision and many clinicians believe that achieving good placement habits between them and the client resolves the issue for them. It is good to have these choices available.

Inadequate lighting is another factor that can influence posture to a great degree. Clinicians will often change their own posture and seated position because they just can't see. Lighting that cannot be directed precisely and focused on specific needs should be replaced. It is a sad commentary, but clinicians usually compensate by changing themselves rather than a piece of equipment.

Figure 5. Student is bending at the waist rather than hinging. The rounded upper back places stress on the neck, back, and diaphragm.

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Figure 7. Clinician fully supports the left lean by bracing with his leg and with his elbow on his thigh. The body is very centred and the alignment in head and torso is "up."

Figure 6. Body weight is "up." Student hinges from the hips, maintaining natural low back curve, and the head is slightly forward. Note use of scopes.

It is important to change the client's position to best suit the clinician's needs. Hygienists should take frequent breaks to allow their muscles a chance to relax. The clients will appreciate a break as much as the hygienists. After all, clients will be sitting in the chair for only an hour twice a year. Clinicians work there every day and must keep themselves safe and healthy.

Sitting for a living

Even if the clinician pays careful attention to maintaining a good neutral posture, sitting places 35% more pressure on the discs of the lower back compared with standing or walking. Movement away from the centre of the body creates an off-centred loading on the spine's discs. Over time, this can wear away the integrity of the disc's structure.

Sitting also transfers the weight of the upper body from the feet to the buttocks. Studies show that 65% of the body weight falls on the two small "sit" bones.¹² This compression restricts blood flow to the area and muscles will fatigue rapidly. Skin tissues in the buttocks are very sensitive and may begin to burn.

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Some experienced hygienists have discovered "tricks" to take the load off the shoulders by temporarily resting their elbow or forearm on the thigh.

If the seat pan hits behind the knees, the pressure on both buttocks and legs can restrict blood circulation to the legs and feet, causing discomfort, cramping, and swelling of the lower limbs. Office workers usually start to "fidget" within a few minutes of sitting in a chair, but many hygienists have trained themselves to sit in one position until all procedures are finished.

Most clinicians prefer to use a flat seat pan and will lean against the back of the chair. This offers support to the mid- and lower spine when the body is sitting upright, but it also immobilizes the bottom half of the torso on the chair. This makes it difficult to reach without overstretching. Reaching across the body forces the body to twist and any amount of twisting is extremely hard on the back. One should not twist ... ever.

With the back against the chair, the hygienist is forced to bend from the waist to reach the objective. This further decreases the lumbar curve and places exceptional stress on the back muscles.

This is the reason that most clinicians "perch" on the edge of their chairs. It allows them to hinge at the hips rather than the back and is easier on the spine than bending from the

waist. (Accidents will happen, however, and the chair can slip out from under when least expected.)

Most modern office chairs have controls so the seat pan can tilt forward from the straight position. The concept behind this forward tilting is valid as it maintains the natural curvature of the spine when one leans forward. However, it probably is not recommended for an all-day sitting posture in the operatory unless the clinician can (and will) adjust the chair between the two positions as needed.

One chair does not fit all. It is important to find a chair that fits like a glove. It should also have all the features and adjustments required for all tasks performed. But the reader should be prepared; such chairs are not cheap.

Things to consider in chair design are (1) adjustability in height for seat and back angles; (2) controls that are quick and easy to operate from a seated position; (3) seat cushioning appropriate to the body weight; and (4) a chair that is stable and moves easily.

Butt out

The low back muscles are very tight and their natural curve is minimal but crucial. Here are tips on how to lean forward but maintain the curve of the back:

- Shift forward to the centre or edge of the chair and rotate the hips to "butt out." The back is flat with its three curves, the neck muscles are even, and the chin is in. It is a beautifully simple way to bend forward to work.
- Raise the back of the seat slightly, tilt the seat pan forward, or move out slightly from the seat back and stretch the legs out further for balance. The tilted position will create more lap space and will bring the clinician and the client's head closer together.
- Use a wide base of support with the feet. A "tripod" stance will provide stability plus the legs and feet will take the weight of the body. This position is not delicate or elegant but it does the job. Tilting the pelvis and leaning forward slightly will bring the client's head closer to the seated position.
- Use some "dynamic" seating exercises (fidget, squeeze the buttock muscles for 10 seconds and then release, do subtle weight changes, get up and physically change positions frequently) to counter the effects of sitting.

Support the various parts

In the early 1990s, Swedish orthopedic surgeon Tommy Öberg designed a horseshoe-shaped cushioned rest that surrounds the top edge of the client's chair, and a broad, articulating arm rest for the clinician's chair. Both rests were designed to offer support for the forearms, greatly reducing the static load on arm and shoulder muscles. The rests do not have to be used all the time but are always available to offer a platform for the working arms when needed and appropriate. Hygienists in Sweden and other countries in Europe are using these chairs. One clinician with previous problems with neck and shoulder pain stated that, in her opinion, this was the best thing that had happened during her career as a dental hygienist.¹³

Hygienists I have spoken to have yet to try this as a tool, and most mentioned a host of reasons not to use one. However, using a rest to help support and stabilize the arm is not inappropriate from a biomechanical point of view. Typists use palm supports on their keyboards to rest their forearms when not actively typing. Electronics engineers use padded table edges to provide stability and support for their forearms. These are simple yet very effective ergonomic solutions for similar problems facing hygienists.

If a hygienist can maintain a good alignment at all times, with shoulders relaxed and elbows close to the body, perhaps a support is not needed. But the reality is that most hygienists find themselves at some point lifting their elbows to the side to clear the patient's mouth, to hold a cord, to get a better position for a certain procedure, etc. And when the elbow is held out, the shoulder will be vulnerable to serious stress. Fatigue is the first symptom when the muscles are receiving little or no blood flow. As a last effort, just before they fatigue out, muscles in the shoulders, arms, wrists and fingers will tighten even more to maintain control ... just when a relaxed grip is needed to operate the instruments.

Some experienced hygienists have discovered "tricks" to take the load off the shoulders by temporarily resting their elbow or forearm on the thigh (see Figure 7). That is the same idea as Öberg's chair design.

Conclusion

Whether a person is playing, sleeping, or working, the biomechanical principles of how the body works are all the same. It doesn't really matter what one does; it's *how* one does it that is important.

It is necessary to pay attention to the messages that the body sends. If the body is uncomfortable, there is a reason. Aches and pains, tension and fatigue, a painful range of motion, or a lack of strength are significant clues to examine. When something hurts, one should figure out *why* and change the situation, not being afraid to experiment.

Remember, a person gets only one body and it has to last. To quote Eubie Blake on his 101st birthday, "If I had known I was gonna live this long, I woulda taken better care of myself."

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"UNLIMITED CAPABILITIES" (continued from page 147)

to use their education and expertise in a wide variety of practice settings. These new conditions will improve not only the quality of life for Canadians but also recruitment and retention within the profession.

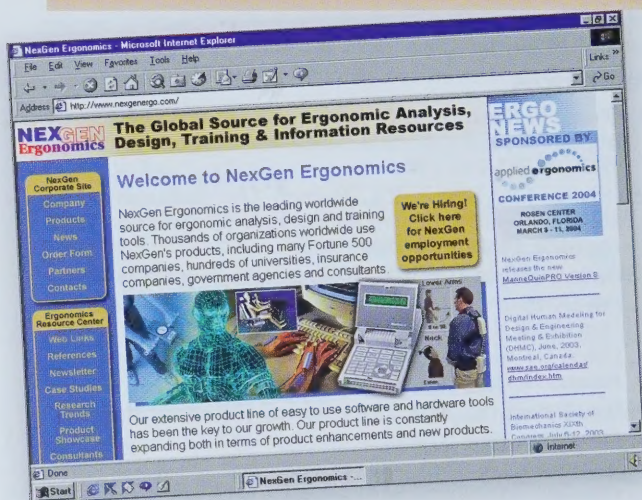
Human resource issues have created a "panic attack" within the traditional oral health workplace. It is becoming more and more apparent that certain dental hygiene services are valued more than others when an economic crisis is at hand. As long as a dental auxiliary can scale teeth, this seems all that matters. The quality of care apparently becomes insignificant in light of the "shortage issue." This reality check prompts us to become proactive, to define for ourselves who we are as professionals and not to let others define us. We can be entrepreneurs. We can work collaboratively in a wide variety of practice settings. We can become educators and researchers. We can be change agents. Or we can be auxiliaries. I do not believe Canadians need more auxiliaries. Canadians need proactive prevention profes-

sionals who advocate for improved access to preventive oral health services.

The need for improved access to preventive oral health services for Canadians may seem overwhelming but there are many dedicated people working toward this dream. Both members and staff have worked diligently to create national standards for education, access, and legislative reform through written policies, documents, briefs to government, and by having a seat on key committees commissioned with the task of being change agents. The dedication and vision of individuals from coast to coast have brought our profession along its evolutionary journey, and it will be the visionaries of the future who continue the dream.

Finally, one last thought—our capabilities are limited only by our willingness to explore the possibilities. Explore and be inspired!

Karen Wolf can be reached at <president@cdha.ca>. 



by Karen Wolf, DipDH

Summer fun is finally here! Once again rest, relaxation, and recreation are the main events. If you are anything like me, summertime is a time to catch up on some reading. I usually take my book to the beach but on those rainy days, I also take time to browse on the WWW. For your browsing pleasure, I have found some interesting sites on ergonomics for you to check out.

What is ergonomics? The term comes from two Greek words, "ergon" meaning work and "nomos" meaning law or custom—in short, the study of human capabilities in relationship to work demands.

Vermont Safety Information Resources, Inc. (<http://siri.uvm.edu/ppt/dentalergo/>)

This company has put out a PowerPoint presentation, "Ergonomic Applications to Dental Practice," in which it is reported that neck and low back pain are the most work-related musculoskeletal disorders (WMSD) reported by dental hygienists.

NexGen Ergonomics (www.nexgenergo.com/)

This site boasts that it is the "worldwide source for ergonomic analysis, design and training tools." Here you will find sections such as: *Web Links, References, Newsletter, Case Studies, Research Trends, Product Showcase, Consultants Directory, and Employment.*

OSH.Net (www.osh.net)

This is an Internet gateway site for occupational safety and health information and resources. The site has over 1,300 annotated links to interesting Internet sites containing a vast amount of information on health and safety.

ERGOWORLD

(www.interface-analysis.com/ergoworld)

This site bills itself as a comprehensive "Ergonomics and Human Factors meta site." It includes information on office ergonomics, industrial ergonomics, injury prevention/treatment, HCI or human-computer interface/usability, air and ground human factors, and product design. It also includes information on products, jobs available, consultants and organizations, university programs, and industry events.

Spine-health.com

(www.spine-health.com)

This site provides comprehensive information and resources to help patients understand, prevent, and seek appropriate treatment for back and neck pain. The site is written by a multi-specialty group of physicians and meets all of the quality criteria of the National Institutes of Health.

National Institute of Neurological Disorders and Stroke (NINDS)

(www.ninds.nih.gov/health_and_medical/pubs/carpal_tunnel.htm)

The NINDS (part of the U.S. National Institutes of Health) publishes a fact sheet on carpal tunnel syndrome. This comprehensive document defines the syndrome and briefly describes its symptoms, causes, risk factors, diagnosis, treatment (surgical and non-surgical), and prevention as well as the research being done.

Proctor and Gamble

(www.dentalcare.com/soap/conteduc/ofmm.htm)

This site has a continuing education course for office managers, "Ergonomics in Dentistry," that is worth looking into (plus, it is free). "One of the occupational hazards of dentistry is carpal tunnel syndrome. This course presents information that explains the cause/effect relationship of certain positioning concerns that can place a clinician at greater risk for both carpal tunnel syndrome and back strain. Etiologies, symptoms, diagnoses, risk factors, preventive measures, and treatment are discussed."

Until next time... 

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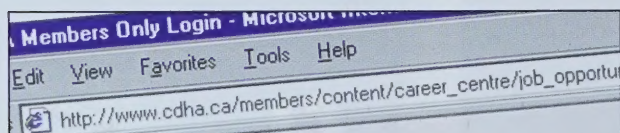
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VOLUME 37 NUMBER 5

Conference Review



Expanding Horizons

14th Annual Professional Conference
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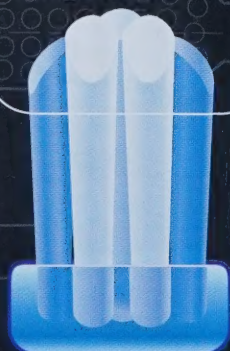


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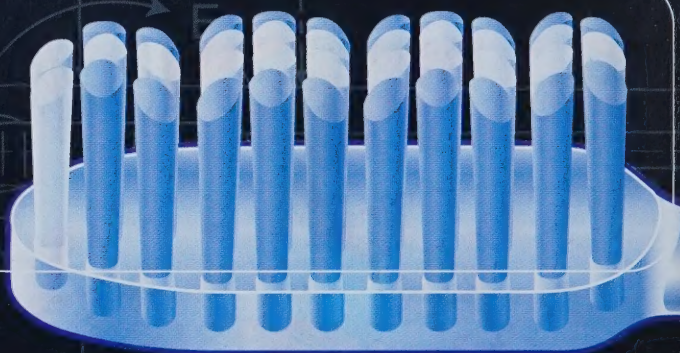


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* Reynolds, H.S. and Zambon, J.J. Microbiological and Clinical Alterations From Using Butler "GUM" Toothbrushes. J Dent Res 76, Abstract #1753, 1997.



HEALTHY GUMS. HEALTHY LIFE.™

Expanding Horizons to Turn Ordinary into Extraordinary

by Karen Wolf, DipDH



Élargir nos horizons pour transformer l'ordinaire en extraordinaire

195

par Karen Wolf, DipDH

Throughout my year as CDHA President, I have been so impressed with the inspiring creativity and energy of dental hygienists. When a group of professionals—who work mostly in isolation—are given the opportunity to come together, professional and personal horizons expand. This was very evident at our 14th Annual Professional Conference, “Expanding Horizons,” held in Regina this past June.

Even before the conference officially started, meetings were being held throughout the conference facility and professionals from across the country, connected in some way to the profession of dental hygiene, met to talk and collaborate. Networking already underway, the conference began with the opening ceremonies that are always a wonderful launch to the weekend.

This year's conference committee did an outstanding job in planning the weekend's social events. We had two evenings when we could relax and have a few laughs with friends both old and new. I would like to express my appreciation to Irene Buzash, Sheila Petrollini, and the entire organizing committee for their dedication and hard work.

A friend sent me an e-mail a while ago that said: “A strong woman accomplishes greatness because she is fearless. A woman of strength accomplishes greatness despite her fears.” On day two of the conference, creativity and strength of character were shown by Laura MacDonald, Susanne Sunell, and Salme Lavigne who became session educators when, at the last minute, one of the presenters was unable to attend. To these three as well

Tout au long de mon année à la présidence de l'ACHD, j'ai été impressionnée au plus haut point par la créativité et l'énergie inspirantes des hygiénistes dentaires. Lorsqu'un groupe de professionnelles qui travaillent la plupart du temps en isolation, ont l'occasion de se réunir, leurs horizons professionnels et personnels s'élargissent. Ce qui s'est avéré très évident à notre 14^e conférence annuelle, à Regina, en juin dernier, sous le thème « Élargir nos horizons ».

Même avant le début officiel de la conférence, des réunions se tenaient dans tout le centre des congrès ; et des professionnels de tous les coins du pays ayant un rapport quelconque avec l'hygiène dentaire, se réunissaient pour échanger des points de vue et coopérer. Le réseautage étant déjà lancé, la conférence a commencé avec les cérémonies d'ouverture qui représentent toujours un merveilleux lancement du week-end.

Le comité organisateur de la conférence de cette année a fait un travail remarquable en planifiant les activités sociales du week-end. Nous avons eu deux soirées où nous avons pu nous détendre et rire entre amis, anciens et nouveaux. J'aimerais exprimer ici mon appréciation à Irene Buzash, Sheila Petrollini et à tout le comité organisateur pour leur dévouement et leur gigantesque travail.

Il y a quelque temps, une amie m'a envoyé le courriel suivant : « Une femme forte atteint la grandeur parce qu'elle est sans peur. Une femme ayant de la force atteint la grandeur malgré ses peurs. » Le deuxième jour de la conférence, Laura MacDonald, Susanne Sunell et Salme Lavigne ont fait preuve de force de caractère en se transformant en formatrices de sessions lorsque, à la dernière minute, une des présentatrices s'est trouvée dans

A person never
knows the
adventures in store
when they walk
through the door
of opportunity.

EXPANDING HORIZONS TO TURN ORDINARY INTO
EXTRAORDINARY ...continued on page 211

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THE PROBLEM OF PORTION DISTORTION

Obesity is rampant in North America. In the U.S., where it accounts for more than 280,000 deaths a year,¹ two in three adults are currently classified as overweight or obese, compared to fewer than one in four in the 1960s. According to Statistics Canada, in 1998-99, one in two Canadians between the ages of 20 and 64 years were either overweight or obese,² more than twice 1985's figures.³

It's easy to blame modern technology for affording us the "luxury" of a sedentary lifestyle. But the fact is we're overeating. Today's serving sizes bear little relation to those recommended in government guidelines or printed on food

labels, and the problem is insidious. For example, when Hershey's milk-chocolate bar was introduced, it weighed 17 grams (0.6 ounces). Well, it's grown! It now ranges in size from 45 to 230 grams (1.6 to 8.0 ounces). Coca Cola, upon its introduction, contained 192 mL (6.5 ounces). Today, a kiddie-size soft drink at a fast-food emporium is 355 mL (12 ounces). Seeing more tooth decay lately?

But the problem isn't just with "junk" food. Standard portions of most all foods have increased to mammoth proportions,⁴⁻⁷ to the point where people have lost the concept of what constitutes a normal serving. When, in a dietary study, American college students were asked to find "medium" size food items (e.g., bagel, potato, muffin, etc.), those they brought back were three times larger than the standardized sizes in *Canada's Food Guide to Healthy Eating*.⁸

What's more, people tend to eat the amount they're served, not the amount they need. In a recent study of healthy Americans, 51 men and women (aged 20-30 years) were randomized to four different meals of macaroni and cheese (500 g, 625 g, 750 g or 1000 g). Permitted to eat as much as they wanted, they consumed 30% more when served the largest versus the smallest portion ($p < 0.0001$);⁹ an increase of 160 calories. Satiety wasn't an issue; no one reported feeling fuller on larger portions or hungrier on smaller ones. Meanwhile, parents teach their kids to clean their plates and health professionals advise their patients to reduce dietary fat, but we all ignore the fact that the reason we're getting fatter is we're eating more.⁵



Supersizing contributes "bigtime" to obesity.

The World Health Organization has listed obesity among the top ten health concerns. If current trends continue, it will overtake smoking as the primary preventable cause of death.¹

References: 1. Manson JE and SS Bassuk. 2003. Obesity in the United States. A fresh look at its high toll. *JAMA* 289:229-230. 2. Statistics Canada. 2003. Body mass index (BMI-International standard), by age group and sex, household population aged 20 to 64 excluding pregnant women, Canada excluding territories, 1994/95-1998/99. www.statcan.ca/english/freepub/82-221-XIE/01201/tables/html/P1211.htm. 3. Katzmarz PT. 2002. The Canadian obesity epidemic: 1989-1998. *CMAJ* 166:1039-1040. 4. Young LR and Nestle M. 2003. Expanding portion sizes in the US marketplace: implications for nutrition counseling. *J Am Diet Assoc* 103:231-234. 5. Young LR and Nestle M. 2002. The contribution of expanding portion sizes to the US obesity epidemic. *Am J Public Health* 92:246-249. 6. National Alliance for Nutrition and Activity. 2002. *From Waist to Waistline: The Hidden Costs of Super Sizing*. NANA, Washington, DC. 7. Smiciklas-Wright H et al. 2003. Foods commonly eaten in the United States, 1989-1991 and 1994-1996: Are portion sizes changing? *J Am Diet Assoc* 103:41-47. 8. Anon. 2000. Portion Distortion. *Consumer Reports on Health*, July:8-9. 9. Rolls BJ et al. 2002. Portion size of food affects energy intake in normal-weight and overweight men and women. *Am J Clin Nutr* 76:1207-1213.



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EXECUTIVE DIRECTOR'S MESSAGE

MESSAGE DE LA DIRECTRICE GÉNÉRALE

Professional Depth

by Susan Ziebarth, CHE



The depth and strength of a human character are defined by its moral reserves. People reveal themselves completely only when they are thrown out of the customary conditions of their life, for only then do they have to fall back on their reserves.

— Leon Trotsky (diary entry for 5 April 1935)

La profondeur professionnelle

par Susan Ziebarth, CHE

La profondeur et la force de la nature humaine sont définies par ses réserves morales. Les gens se révèlent eux-mêmes complètement seulement lorsqu'ils sont projetés hors des conditions ordinaires de leur vie, car c'est seulement alors qu'ils doivent faire appel à leurs réserves.

— Léon Trotsky (inscription de journal pour le 5 avril 1935)

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This issue of *Probe* highlights CDHA's 14th Annual Professional Conference in Regina, which had the theme "Expanding Horizons." In my presentation on Friday evening at the opening ceremonies (a summary of which is included in this issue), I spoke of complexity leadership, living on the edge of chaos, essential characteristics of professional leaders, and dental hygienists' leadership skills. What I didn't know while I was delivering this very talk was that our keynote speaker had not boarded her airplane. What ensued over the next 24 hours was quite fascinating: in one very concentrated dose, I was both participant in, and witness to, what I had just spoken about!

In the very early hours of Saturday morning—even before the dew had settled—I began with a few phone calls to respected dental hygienists. Word started to spread, and phone calls were made and received at a fast and furious pace. By 8 a.m., with input from many attendees, we had a new program for the day. Patricia Johnson agreed to step into the keynote position with her presentation "Dental Hygiene in Canada: Patterns, Trends, and Changes," and Salme Lavigne and Susanne Sunell presented on "Periodontal Medicine" and "Musculoskeletal Health and Dental Hygiene Practice" respectively. Laura MacDonald developed an interactive workshop entitled "The Fifth Element – Finding Your Passion in Dental Hygiene."

PROFESSIONAL DEPTH...continued on page 211

By 8 a.m., with
input from many
attendees, we had
a new program
for the day.

Ce numéro de *Probe* souligne la 14^e conférence annuelle de l'ACHD, à Regina, sous le thème « Élargir nos horizons ». Lors des cérémonies d'ouverture, dans ma présentation du vendredi soir (dont un résumé apparaît dans ce numéro), j'ai parlé d'un leadership de la complexité, de vivre au bord du chaos, des caractéristiques essentielles des leaders professionnels et des compétences en leadership des hygiénistes dentaires. Je que j'ignorais, à ce moment-là, c'est que notre conférencière invitée avait raté son envolée vers Regina. Ce qui s'est produit au cours des 24 heures suivantes s'est avéré très fascinant : en une dose très concentrée, je fus à la fois participante et témoin de ce dont je venais tout juste de parler !

Tôt le samedi matin, avant même que la rosée disparaisse, je commençai par appeler des hygiénistes dentaires respectées. Le mot commença à se répandre, et les appels téléphoniques se mirent à entrer et à sortir à une cadence rapide et furieuse. Vers 8 heures, avec la collaboration de plusieurs participantes, nous avons un nouveau programme pour la journée. Patricia Johnson accepta le rôle de conférencière invitée avec sa présentation « L'hygiène dentaire au Canada : modèles, tendances et changements »; Salme Lavigne et Susanne Sunell firent respectivement des présentations sur « la médecine parodontique » et « la santé musculosquelettique et la pratique de l'hygiène dentaire ». Laura MacDonald élaborait un atelier interactif intitulé « Le cinquième élément – trouver notre passion en hygiène dentaire ».

LA PROFONDEUR PROFESSIONNELLE...suite à la page 211

Elvis Is Alive and Well in Regina!

Perspectives on the 14th Annual CDHA Professional Conference

by Irene Buzash, RDH, and Sheila Petrollini, CDA, RDH, Conference Co-Chairpersons

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Happy Birthday, Regina! In 2003 our city is 100 years old and looking darn good for her age. The birthday party included 100 candles on the birthday cake, a magnificent fireworks display, and a visit by His Royal Highness Prince Edward. And a special thanks to the committee that arranged for the spectacular prairie thunderstorm that graced our skies on Friday evening. In amongst the birthday festivities, the CDHA celebrated its 14th Annual Professional Conference.

The conference theme, "Expanding Horizons," was appropriate for a province known as the "land of the living skies." It was also timely for our profession as many changes are happening, such as self-regulation in eastern provinces, the debate over scaling modules for dental assistants, and the continued increase of dental hygienists seeking employment in alternate practice settings.

Members of the Regina Lions Band reflected this theme in the opening ceremonies, as the presidents of each provincial association marched in to the beat of the drums during the Ceremonial Parade of Flags. A solo trumpet player made our hearts swell with pride as she provided the music for "O Canada." An abundance of welcome greetings were provided by the conference chairs, a Regina city councillor, Darlene Hincks, and the Presidents of CDHA, Karen Wolf, and SDHA, Kiran Merton. Executive Director Susan Ziebarth presented an interactive alien adventure that enlightened us as to what is happening in each province. To conclude the opening ceremonies, it was our privilege to introduce SDHA's new Executive Director, Barbara Long.

The President's Welcome Reception was held at the Regina Show Lounge with the conference delegates conveyed there and back in Regina's classic trolley bus. At the reception, delegates had the opportunity to meet and greet new and old friends and sample a fabulous hot and cold finger food buffet. The Show Lounge featured Robert Larrabee in his tribute to "The Legends." The comedic, audience-interactive,

Irene Buzash, a graduate of the universities of Manitoba and Regina, has worked for the past 34 years in general and periodontal practices. Since 1988, she has taught in the Dental Hygiene program at the Saskatchewan Institute of Applied Science and Technology (SIAT) in Regina. She has held various positions in SDHA such as President, Board member, Constitution Chair, Membership Chair, and is currently Continuing Education Chair.

Sheila Petrollini, a graduate of SIAT, won the CDHA Student Dental Hygienist Scholarship in 1999. She has worked in general practice for the past three and a half years in both Victoria and Regina and is a council member of SDHA.



full-costume tribute artist provided us with our first Elvis sighting as well as tributes to Roy Orbison, Garth Brooks, and the dynamic duo of the Blues Brothers. Thanks to our delegate Elwood.

A slight bump in the road occurred on Saturday morning: our keynote speaker was missing in action due to missed flights. The resources of CDHA staff, and CDHA delegates in attendance, came to the rescue. We would like to again thank Salme Lavigne, Laura MacDonald, Susanne Sunell, and

Patricia Johnson for stepping up to the plate and showing us true leadership and the wealth of knowledge that exists in our membership.

The scientific sessions covered a wide range of dental hygiene practice applications and educational interests, from oral health for the elderly, trends in dental hygiene, instrument modifications for periodontal therapy, and nutrition for dental health to Community Connections talks on mouthguards and mobile dental health services.

Because of the variety of topics and delegates' interests, it is always difficult to choose among the concurrent sessions, so once again registrants were able to purchase the complete taped highlights of each session.

The exhibitors were a great attraction, as is usual at CDHA conferences. The exhibitors were well informed, eager to discuss their products, and generously provided samples. The exhibitors are the first to acknowledge the role of the dental hygienist in the marketplace. Karen Wolf, President of CDHA, presented each exhibitor with a gift as appreciation for their participation in the conference.

Saturday evening's Applause Feast and Folly dinner theatre provided us with our second Elvis sighting. "You Cruise, You Lose" had the employees of a cruise ship take over when the real entertainers were missing in action—lots of music and laughter. During the breaks, the cast became the waiters and served us a wonderful three-course meal.

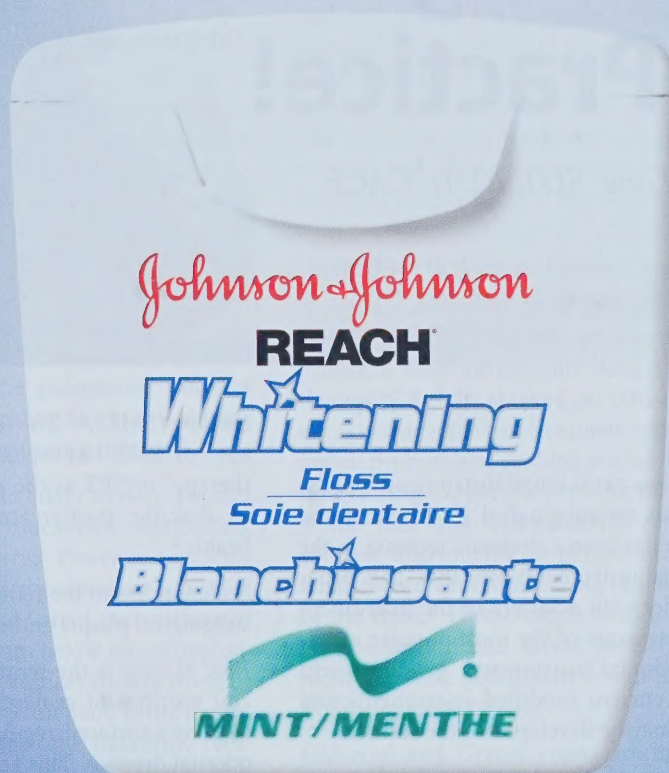
Sunday's Town Hall Meeting was well attended. Delegates were put into groups and discussions took place regarding the ends and means of CDHA.

Following the morning keynote addresses, the closing ceremonies began with a heartfelt thanks to the various commit-

ELVIS IS ALIVE AND WELL IN REGINA!

...continued on page 229

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Instrument Options for Non-surgical Periodontal Therapy

– How To Decide What's Right for Your Practice!

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by Barbara A. Long, SDT, RDH, CACE

The following is based on a presentation made at the CDHA conference in Regina, Saskatchewan, in June 2003.



Introduction

This article will review periodontal instrument application with emphasis on subgingival instruments and procedures. There has been a dramatic increase in the array of modified manual instruments available. This paper will familiarize the reader with a variety of the instrument modifications and review some of the most popular modified non-surgical periodontal instruments. It will present techniques to evaluate current modified instruments and those instruments that may be developed in the future.

A recent position paper of the American Academy of Periodontology (AAP)—“Treatment of Plaque-Induced Gingivitis, Chronic Periodontitis and Other Clinical Conditions”—affirmed the beneficial effects of scaling and root planing combined with plaque control by the client in the treatment of chronic periodontitis.¹ These beneficial effects include a reduction of clinical inflammation, microbial shifts to a less pathogenic subgingival flora, decreased probing depth, gain of clinical attachment, and reduced disease progression.¹ The AAP paper also lists several research efforts that confirm, although clinical conditions generally improve following root planing, some sites still do not respond to therapy. The following factors may limit success: root anatomy (e.g., concavities, furrows, etc.), furcations, and deep probing depths.¹

Definitions

Periodontal debridement is the treatment of gingival and periodontal inflammation through mechanical removal of tooth and root surface irritants to the extent that the adjacent soft tissues maintain or return to a healthy non-inflamed state. Debridement includes initial or active periodontal treatment followed by periodontal maintenance

therapy (PMT).^{2,3} The term “periodontal maintenance therapy” or PMT has replaced that of “supportive periodontal therapy” or SPT as the most recently accepted terminology to describe post-treatment preservation of periodontal health.²

Scaling refers to the removal of supragingival and accessible subgingival plaque and calculus including all pocket depths.

Root planing is the removal of residual embedded calculus and portions of cementum from root surfaces in order to treat root surface irregularities or alterations caused by periodontal diseases. This action in turn eliminates and/or suppresses infectious micro-organisms to promote resolution of inflammation.²

Deplaquing or *root debridement* refers to the disruption/removal of dental plaque and biofilms from root surfaces that are inaccessible to the patient.^{3,4} The purpose of deplaquing is to remove plaque biofilm, endotoxins, and recently formed, lightly mineralized calculus that may have developed between periodontal maintenance therapy appointments. These products are removed to prevent further periodontal breakdown. Root debridement is not intended to remove cementum, dentin, or heavy calculus, but to gain access to every square millimetre of subgingival root surface in order to mechanically disrupt soft but adherent deposits in a comprehensive manner.^{4,5} Root debridement is a demanding procedure in the presence of moderate-to-severe attachment loss because of the difficulty of working on variable root anatomy. This is further complicated by limited insertion and access to the base of pockets when the gingiva is no longer edematous and is relatively constrictive at the gingival margin. Achieving comprehensive coverage of deep subgingival contours requires a focused technique of closely placed, overlapping strokes that leave no portion of the root surface untouched. This is true

whether manual instruments or power instruments are used.⁴ The small area of tooth contact of slim power tips requires more intensive instrumentation than the larger contact area of manual instruments, especially those with rounded dull lateral surfaces on their blades. No root structure is consciously removed; the instrument blade or tip disorganizes the plaque on the root surface. During deplaquing with manual instruments, root planing strokes are utilized but very slight lateral pressure is applied. If power instruments are used, very low power settings must be implemented. Both methods require similar time commitments.^{5,6}

Current concepts in non-surgical periodontal therapy

During **initial therapy**, or the active calculus-removal phase of treatment, ultrasonic and sonic power instrumentation alone is not completely effective on the varied root surfaces at increased pocket depths.^{7,8} An *in vitro* research project compared the effectiveness of small-bladed curets against that of slim ultrasonic inserts in removing deposits (paint) from the root trunk and furcation entrance areas of mandibular molar dentiform teeth. The curets proved significantly more efficient than the ultrasonic inserts in both instances.⁷ This result speaks to the prospective value of mini-bladed manual curets in debriding furcations during initial therapy and periodontal maintenance therapy.⁸

Power instruments can be difficult to adapt in deep pockets and can often burnish calculus into concavities, depressions, and the concave portions of the furca.⁶ Power instruments are useful but follow-up manual instrumentation is needed to completely access and debride the varied root surfaces if the pocket depths are more than 4 mm below the cementoenamel junction (CEJ). A variety of vertical strokes must be used with the instrument of choice. With hand instruments, numerous techniques such as extra-oral fulcrums, reinforced instrumentation techniques, stroke length, and increased lateral pressure can be employed. A thorough instrumentation can be achieved by varying the angle of the stroke on the tooth surface, resulting in a variety of criss-cross directions.⁵

Regarding **evaluation of non-surgical periodontal therapy**, a smooth root surface remains the current initial evaluation method for non-surgical periodontal treatment, followed by tissue response. Cobb summarizes, stating "evaluation of tissue response should be performed not earlier than four weeks following treatment. Measurements taken prematurely will not be representative of completed healing and could therefore be misinterpreted as a poor clinical response."⁹ When clients present for their periodontal debridement appointments, their tissues are bacterial laden and the clinician sees the gingival tissue in its worst condition. A four-week healing period is required for the gingiva to reach optimum health for re-evaluation.

In summary, scaling, root planing, and deplaquing are not separate procedures. The difference among these treatment modalities is a variation in degree. As treatment progresses, a decrease in lateral pressure is required as well as a varied stroke direction in a cross-hatching pattern and the use of

numerous and longer strokes. A sharp cutting edge is needed on the manual instrument for scaling and root planing, while deplaquing is best achieved with a dull cutting surface contacting the root surface in order to minimize trauma to the root structure.

Thorough hand instrumentation remains the necessary follow-up to ultrasonic/sonic treatment on all client types regardless whether initial or periodontal maintenance therapy is being provided. The amount of lateral pressure applied varies with the nature of the deposit being removed. Heavy deposits require firm pressure that must be carefully directed and applied, while plaque and lightly mineralized deposits require less pressure.⁵ Substantial pressure is also required when removing tenacious or burnished deposits. Modified instruments, by allowing a wider variety of strokes or force application, may help in removing these deposits. The clinician must remember not to over-instrument root surfaces and remove unnecessary tooth structure or to have too sharp an instrument blade when removing plaque from a root surface that has been completely instrumented for calculus removal.

A recent publication stated that plastic curets were as effective at deplaquing during root instrumentation as were conventional steel instruments during supportive periodontal therapy.¹⁰ Results showed no statistically significant differences between the two treatment modalities regarding bleeding on probing and probing pocket depth at any observation time during supportive periodontal therapy. The study suggested that non-root-substance-removing curets may be valuable instruments for periodontal patients during maintenance care, thus minimizing trauma on the hard structures of the teeth.⁵ Plastic curets tend to be bulkier, which may make insertion and access problematic. Further development in plastic instrument design may improve their accessibility and adaptability.

Universal and Gracey curets are the hand instruments of choice for sulci of normal depth. In shallow sulci, the root surface is broad and generally flat and a regular blade is appropriate to adapt to all surfaces. As pocket depth increases, when the blade is adapted at the correct angle, the terminal shank compensates and loses the parallel relationship to the surface being instrumented. The result is an inability to access the base of the pocket.⁵ Hence, instrument choices will vary.

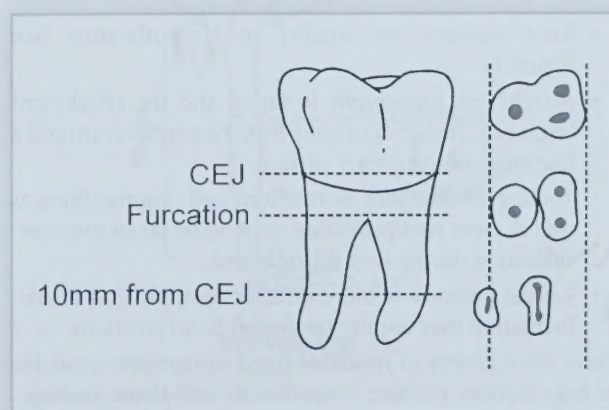


Figure 1. Root surface circumference

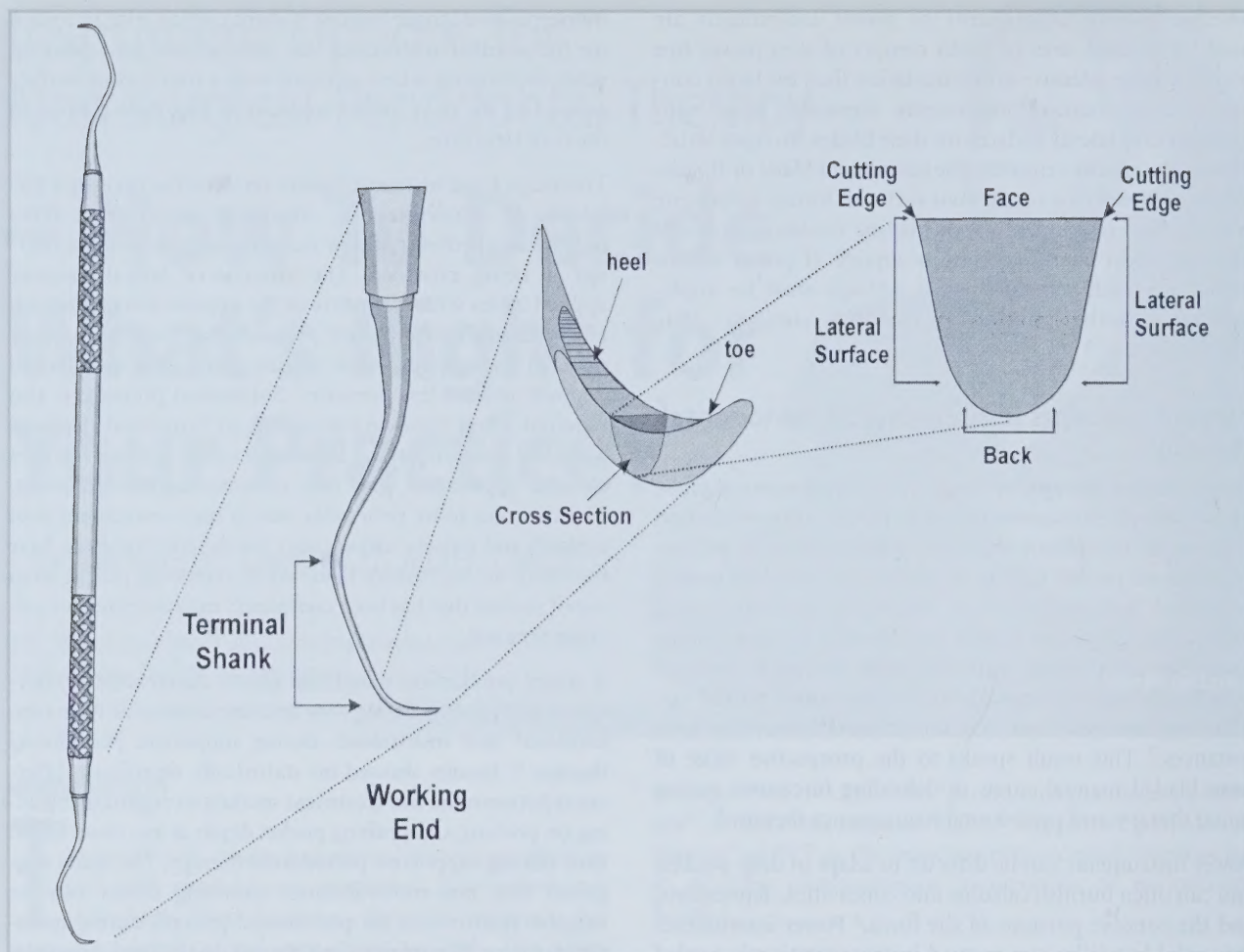


Figure 2. Anatomy of a curet

Subgingival root surfaces more than 4 mm below the CEJ demonstrate concavities, depressions, and furcation entrances. With the considerable diversity in root surface anatomy, a greater variety of instruments is necessary. Instruments have been modified in recent years to improve access, adaptation, and the variety of activation techniques in order to deal with the complicating factors created by increased loss of attachment.

As pocket depth increases, there are several variables to consider when attempting to contact the entire root surface within a pocket that has deep subgingival attachment:

- Root surfaces are smaller in circumference (see Figure 1).
- Attachment topography is varied and the attachment levels can change drastically from one surface, around a line angle onto another surface.
- Tooth positions such as rotations and tipping/tilting as well as close root proximity must all be taken into consideration during root debridement.
- Lateral pressure is more difficult to apply and instrumentation may require reinforced hand positions.

There are a variety of modified hand instruments available to help achieve positive outcomes in soft-tissue management, taking into consideration all these important variables in root surface instrumentation.

Variables to consider during instrument evaluation

When evaluating instruments to add to your routine armamentarium, the following variables should be considered when deciding if the instruments will be able to improve treatment outcomes. Figure 2 describes the different areas of and terminology used for curets.

Access

Access refers to the ability to position the blade where it is to be adapted to the tooth surface. Evaluation of the instrument handle, terminal shank, etc. allows one to determine whether one can gain access or "reach" the required tooth surfaces, for example, within the sulcus at pocket depth, under contact areas, in root furcation areas and root concavities, the lingual of mandibular incisors, etc.

Adaptability

Adaptation refers to the placement of the working end of the instrument against the tooth surface that is being instrumented. The primary objective of adaptation is to make the working end of the instrument adapt or conform to the contours of the tooth surface to avoid trauma to the surrounding soft tissues and to avoid client discomfort.

Scalers and curets are adapted with one-third of the working end (the toe end) contacting the tooth surface and the other two-thirds (the heel end) following along behind. On a very

rounded surface, only the very last 1 mm or 2 mm of the instrument contact the tooth surface, while on very flat surfaces, the entire blade may be adapted. This is very important when instrumentation is being carried out on clients with attachment loss involving root surfaces that are diminished in size at increased pocket depths (Figure 3).

One should evaluate whether the blade contacts the desired parts of the tooth surface, for example, under contact areas, within furcations or root-concavities, etc.

Activation

The blade can be activated with the appropriate strokes. Some instruments are designed for heavy powerful strokes while others are applied with light shaving strokes. The clinician should evaluate whether the instrument allows the application of appropriate strokes. For example, is it easier to apply pressure toward the mesial surfaces of posteriors with the Gracey 15/16? Does the EXD explorer make it easier to "feel" the furcation root structure?

Comfort

One should evaluate the instrument while in use to ascertain whether it has any qualities that improve comfort for the clinician, qualities such as a light, large, round handle or grip.

Modification (if applicable)

Does the instrument modification (for example, a longer terminal shank or a shortened blade) improve any qualities for the clinician while in use to improve/increase treatment skills?

Modifications to instruments

Instruments have been modified in recent years to facilitate improved access, adaptation, and a variety of activation techniques. Some instruments have multiple modifications. The modifications below are described relative to the traditional Gracey curet series that is considered the "standard" in this discussion.

Angulation of the blade to the shank

EXD11/12 explorer

Detection skills are as important as the mastery of scaling and root planing techniques. The EXD11/12 explorer is designed for posterior calculus detection in areas of moderate loss of attachment levels, especially on proximal surfaces.

Gracey curet 15/16

This modified curet has the 13/14 angle of the terminal shank with the 11/12 blade angle to improve adaptation to the mesial surfaces of posterior teeth. This instrument allows lateral pressure to be directed toward the mesial surfaces more effectively. It is a variation of the traditional Gracey 11/12 and is designed to remove tenacious and/or burnished calculus on initial and PMT clients. (After Five® 15/16 is available.)

Gracey curet 17/18

Enhanced angulation in the terminal shank is the major modification to improve adaptation to the distal surface of molars. The increase in angulation in the terminal shank allows increased lateral pressure to be directed toward the distal surfaces of molars. It compares to the traditional

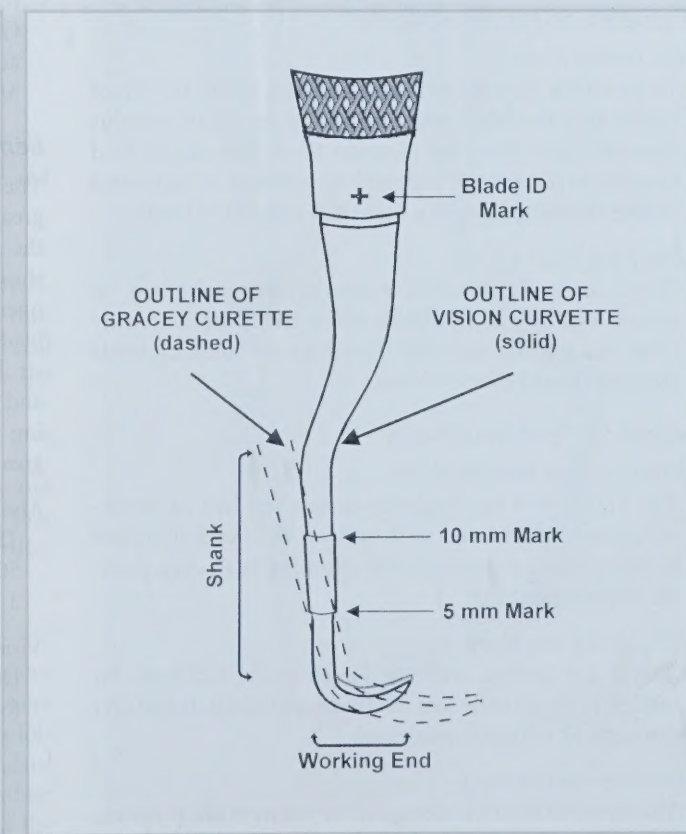
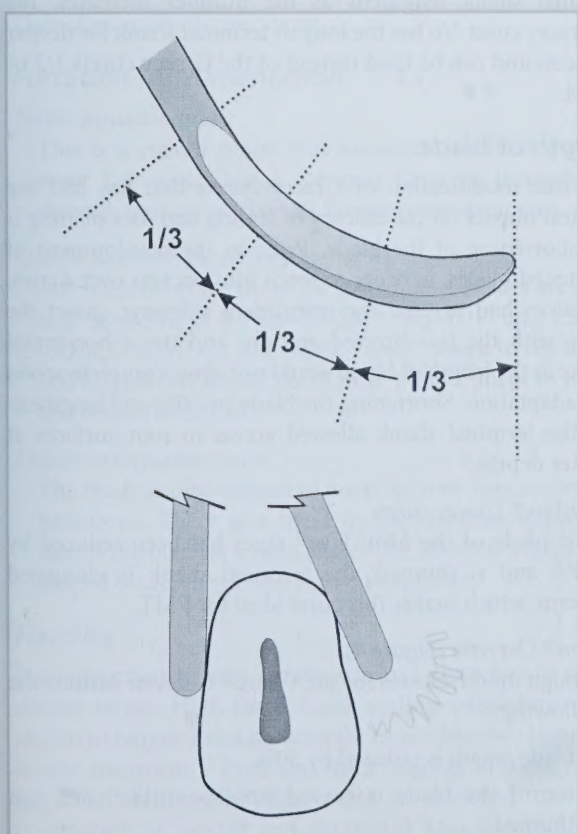


Figure 3. Curet adaptation

Figure 4. Comparison of Vision® Curvette and Gracey curet

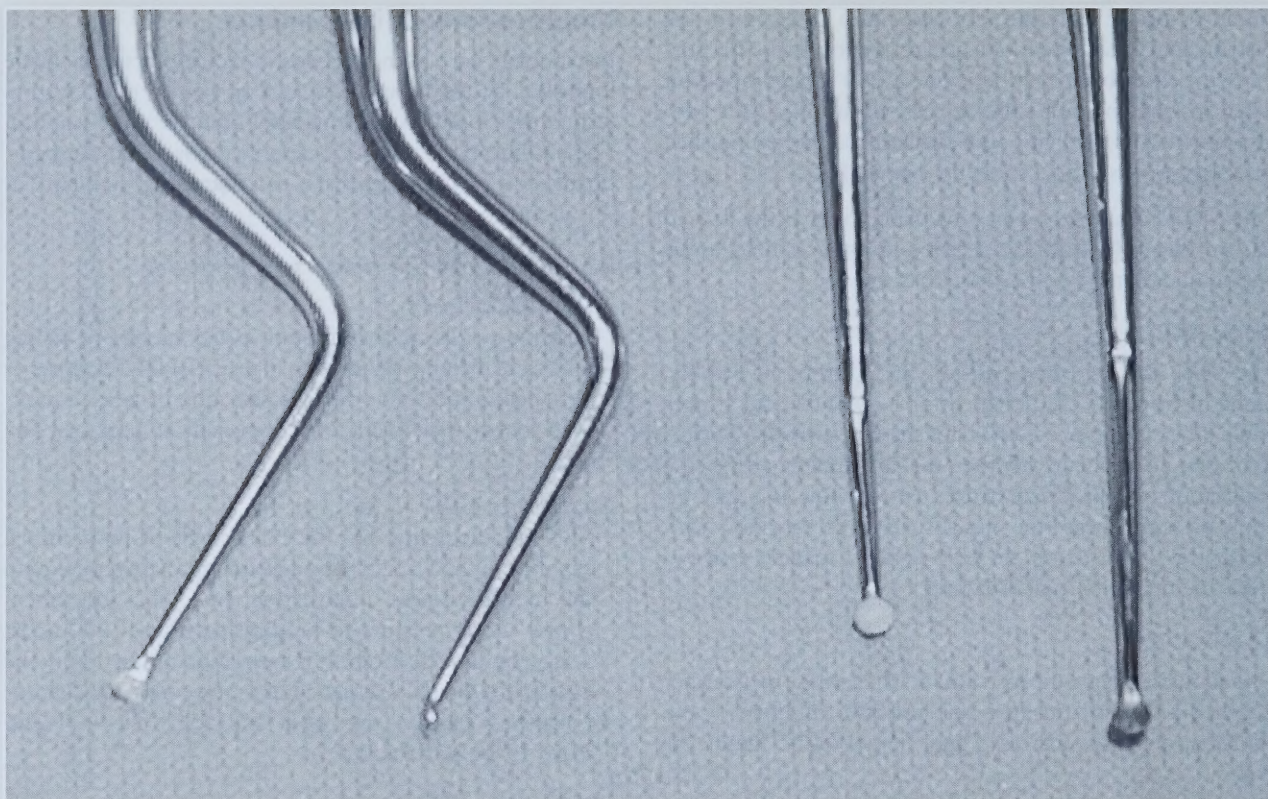


Figure 5. Debridement curet set

Gracey curet 13/14 and is designed to remove tenacious and/or burnished calculus on initial and PMT clients. A Rigid 17/18 is available as well.

Diameter of terminal shank

Rigid Gracey curets

These curets have a thickened terminal shank to reduce instrument flexibility when removing tenacious calculus deposits. They have the identical blade size as standard Gracey curets and are designed for removal of tenacious and/or burnished calculus on initial and PMT clients.

Extra Rigid Gracey curets

These curets demonstrate a heavier terminal shank to reduce instrument flexibility when removing extremely tenacious calculus deposits. They have the identical blade size as standard Gracey curets.

Length of terminal shank

EXD11/12 After Five® explorer

The 11/12 AF is for moderate-to-extreme loss of attachment levels of posterior teeth and has the 3 mm elongated terminal shank to improve detection ability in deep pockets of posterior teeth.

PCPUNC 15 mm probe

This is a screening probe or longer probe (15 mm) for moderate-to-extreme loss of attachment levels. It has very distinctive millimetre markings.

After Five® Gracey curets

The terminal shank is elongated by 3 mm to allow instrumentation in pockets greater than 5 mm. The blade has been thinned, which is ideal for PMT.

Traditional Gracey curets 1/2, 3/4, 5/6⁵

Many operators use the Gracey 1/2 for anterior instrumentation but there are other options to consider. The terminal shank lengthens as the number increases; the Gracey curet 5/6 has the longest terminal shank for deeper access and can be used instead of the Gracey curets 1/2 or 3/4.

Length of blade

The one modification of Gracey curets that has had the greatest impact on the efficacy of scaling and root planing is the shortening of the blade. Prior to the development of shortened blades, in order to reach into pockets over 4 mm, operators had to turn the instrument sideways, insert the blade with the toe directed apically, and use a horizontal stroke as the length of blade would not allow complete access and adaptation. Shortening the blade by 50% and lengthening the terminal shank allowed access to root surfaces at greater depths.⁵

Mini Five® Gracey curets

The blade of the Mini Five® curet has been reduced by 50% and is thinned; the terminal shank is elongated 3 mm, which makes this curet ideal for PMT.

Vision® Curvette (Figure 4)

Design modifications for the Vision® Curvette include the following:

- blade length is reduced by 50%
- toe of the blade is curved up (spoon-like) and not thinned

- terminal shank is straightened (on Sub-0, 11/12, and 13/14) to ease insertion into the sulcus and elongated
- raised border on the instrument shank to determine depth within the pocket; marking starts at 5 mm and ends at 10 mm

The Vision® Curvette is recommended for initial therapy while blade is full-sized and PMT after blade is reduced from sharpening and wear.

Shape of blade / ability to use various strokes

Nevi 1

The Nevi 1 is designed for supragingival instrumentation for anterior use. It has a scaler on one end and an elongated disk end. The entire edge of the disc blade is a cutting edge, enabling a push or pull stroke in all directions. This is suggested for tenacious and/or burnished calculus removal.

Debridement curets (see Figure 5)

These are small disc-shaped blades. The entire edge of the blade is a cutting edge, enabling a push or pull stroke in all directions—vertical, horizontal, or oblique. They have extended shanks for deep pocket access. There are four in the set and their numbers and corresponding areas of use are as follows: 1/2 buccal/lingual; 3/4 mesial/distal; 5/6 anterior; 7/8 anterior extended. They are recommended for root planing following ultrasonic use or heavy deposit removal.

Vision® Curvettes. See above.

Location of blade on shank

Nevi 1. See above.

Debridement curets. See above.

Furcation instrumentation

Naber furcation probe

This is a curved probe that measures furcation involvement (>1 mm Class I, <1 mm Class II; through and through passage is Class III furcation involvement).

Quetin furcation curets (see Figure 6)

The blade is on the tip of the instrument. Blades are available in widths of 0.9 mm (SQBL1, SQMD1) and 1.3 mm (SQBL2, SQMD2). The SQBL 1 and 2 adapt to the buccal and lingual furcations; the SQMD 1 and 2 adapt to mesial and distal furcations.

DeMarco furcation curets

The blade is disc-shaped to adapt to root concavities and furcations. There is a bend in the terminal shank that directs the blade at a right angle. The SDM1 is a large disc-shaped blade; the SDM2 is a smaller blade.

Handles

It is important to vary handle size and diameters to relieve digital stress. High-force hand scaling procedures were shown to fatigue hand muscles for more than two hours following treatment.¹¹ Precision work requires stiffness, meaning that stability of the joints is achieved by static contraction of agonist and antagonist muscles around the wrist, elbow, shoulder, back, and neck. Four or five times

more muscle force must be exerted to pinch objects with the fingertips than to hold them with a power grip (bent fingers, whole-hand grip). A death grip can be a habit.¹¹ This must be taken into consideration when setting up trays; a variety of instrument handles should be made available. As well, clinicians must make an effort not to pinch power hand-pieces to counter the weight of the cord.

Hu-Friedy ResinEight®

These large-diameter handles are designed to be light in weight so there is less digital stress. The handle design is textured to improve tactile sensitivity and the wave grooves increase rotational control and secure the grasp.

Satin Steel®

The large-diameter handles with a stainless steel finish decrease digital stress. Satin Steel Colours® have changeable colour identification bands.

Summary

Modified instruments designed to improve instrumentation techniques may improve results for clients requiring initial therapy. The increased attachment loss requires a longer terminal shank demonstrated in the Gracey curet 5/6 instead of the Graceys 1/2 or 3/4, as well as the After Fives® and the Gracey Vision® Curvettes. For tenacious deposits that require increased lateral pressure, use of the 15/16, 17/18, Rigid or Extra Rigid and the Curvettes may be indicated. Burnished deposits that are unreachable with ultrasonics or traditional instruments require a variety of strokes from different angles/directions and improved access; they may be

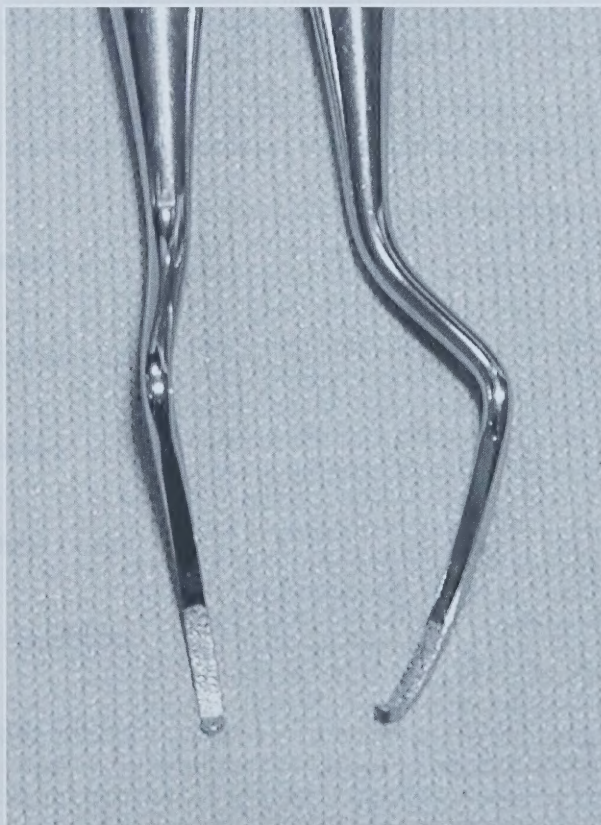


Figure 6. Quetin furcation curets

removed using the 15/16, 17/18, Curvettes®, and Rigid or Extra Rigid.

Suggested instruments for periodontal maintenance therapy clients who demonstrate minimal attachment loss are small bladed to minimize tissue manipulation, such as instruments with narrowed blades from sharpening. In PMT clients with moderate attachment loss, one can use After Fives® (thinned blade and longer shank), Mini Fives® (thinned, reduced blades for smaller root diameters), debridement curets (small round blades that can be utilized with a variety of strokes), and Vision® Curvettes when thinned by use. To access furcations, DeMarco, Quetin, and Curvettes may be used. Thorough hand instrumentation currently remains the necessary follow-up to ultrasonic/sonic treatment on all client types.

As stated earlier, and as every hygienist knows, the most difficult and critical non-surgical periodontal therapy is root debridement. Scaling, root planing, and deplaquing during initial and periodontal maintenance therapy have been greatly enhanced by innovative instrument modifications. It is hoped that this review of some of the more popular modifications made to our traditional armamentarium will assist successful soft tissue management and provide criteria to assess future instruments as they are developed.

AfterFive®, Mini Five®, Vision® Curvettes, Satin Steel®, ResinEight® are registered trademarks of the Hu-Friedy Mfg. Co., Inc. registered in the U.S. Patent and Trademark Office.

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“ÉLARGIR NOS HORIZONS POUR TRANSFORMER L'ORDINAIRE EN EXTRAORDINAIRE” (suite de la page 195)

l'impossibilité d'être présente. À ces trois braves ainsi qu'à Patricia Johnson, je veux exprimer ma gratitude pour un tel soutien éclairé, le don et le savoir-faire qu'on trouve chez les vrais leaders.

Les séances éducatives étaient du calibre le plus élevé et couvrirent une gamme étendue de sujets. Les participants y ont trouvé une occasion en or de parfaite leur éducation — que ce soit au cours de la période de temps passé avec Patricia Johnson à examiner *L'hygiène dentaire au Canada : modèles, tendances et changements*, jusqu'à « Community Connections » avec Dean Lefebvre et Gerrard Weinberger.

Une de mes activités préférées, lors des conférences de l'ACHD, c'est la réunion communautaire parce qu'elle constitue un moment informel où les membres sont en interaction avec leur association nationale. Cette année, nous avons organisé des groupes de discussion qui nous ont permis d'entendre les commentaires et les préoccupations des membres sur les

On ne sait jamais
quelles aventures
nous attendent
lorsqu'on saisit
une occasion.

politiques particulières, en fonction des FINS, du conseil de l'ACHD. Merci à tous les participants pour vos commentaires et l'intérêt que vous portez à votre association nationale.

En terminant, je veux vous remercier, membres de l'ACHD et mes collègues, de l'appui que vous m'avez accordé pendant mon mandat à la présidence. Ce fut une expérience de nature à changer une vie, et que je vais toujours chérir. On ne sait jamais quelles aventures nous attendent lorsqu'on saisit une occasion, en prenant le temps de changer l'ordinaire en extraordinaire. Continuez à travailler ensemble pour créer de nouvelles conditions en vue d'améliorer le

traitement et le système de prestation des soins de santé bucco-dentaire au Canada.

Merci, et que Dieu vous bénisse.

On peut rejoindre Karen Wolf à <president@cdha.ca>.

as Patricia Johnson, I want to express my gratitude for such knowledgeable assistance, for the grace and expertise that is found in true leaders.

The educational sessions were of the highest calibre and covered a range of topics. From our time with Patricia Johnson, reviewing *Dental Hygiene in Canada: Patterns, Trends, and Changes*, to Community Connections with Dean Lefebvre and Gerrard Weinberger, delegates had a wonderful chance to continue their education.

One of my favourite events at CDHA conferences is the Town Hall meeting because it is an informal time when members interact with their national association. This year we organized focus groups so we could hear members' comments and concerns on the specific ENDS policies of the

CDHA Board. Thank you to all who participated for your input and interest in your national association.

In closing I want to thank you, CDHA members and my colleagues, for your support during my term as president. It has been a life-changing experience, one I will treasure forever. A person never knows the adventures in store when they walk through the door of opportunity, taking the time to turn the ordinary into the extraordinary. Keep working collaboratively to create new conditions for improving the oral health care treatment and delivery system in Canada.

Thank you and God bless.

Karen Wolf can be reached at <president@cdha.ca>. 📧

"PROFESSIONAL DEPTH" (continued from page 201)

The review of the conference evaluations revealed that although participants were disappointed the keynote speaker had not arrived, they were astounded at the depth within the profession and the agility and expertise these professionals demonstrated. The profession of dental hygiene has deep reserves. All dental hygienists can be proud to find themselves in such able company. We also wish to thank Oral-B, sponsor for the keynote speaker, for being so responsive in recognizing these dental hygienists who stepped forward to contribute to an excellent program. We look forward to another great professional development opportunity in St. John's, Newfoundland and Labrador, in June 2004.

In the meantime, CDHA will continue to help you expand your horizons by promoting research into dental hygiene

issues, advocating for improved access to dental hygiene services and reimbursement for dental hygienists, providing you with current information regarding your profession, and helping to develop knowledge tools to allow practice in diverse settings with accountability through self-regulation in all jurisdictions in Canada. If you haven't already done so, I encourage you to participate on-line in the members' area, to look for and post events in our events calendar, to browse in the job database, to find your colleagues—other CDHA members whom you don't yet know but who may have expertise to share—and to watch for e-mail alerts to let you know what's new. 📧

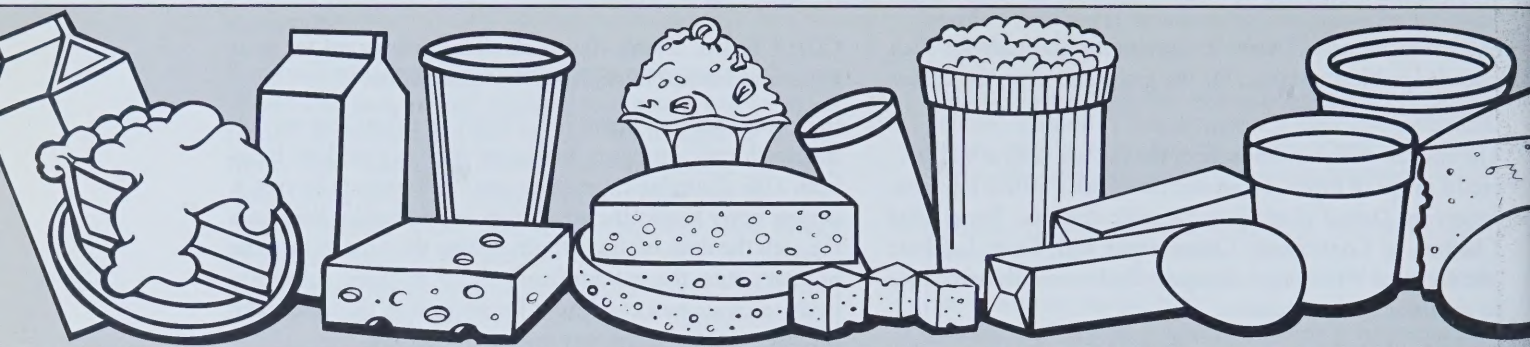
"LA PROFONDEUR PROFESSIONNELLE" (suite de la page 201)

L'examen des évaluations de la conférence a révélé que, bien que les participantes aient été déçues de l'absence de la conférencière invitée, elles ont été étonnées de la profondeur qui existe dans la profession ainsi que de l'agilité et des compétences démontrées par ces professionnelles. La profession de l'hygiène dentaire a des réserves profondes. Tous les hygiénistes dentaires peuvent être fiers de se retrouver en compagnie de collègues aussi capables. Nous voulons aussi remercier Oral B, commanditaire de la conférencière invitée, pour une telle réceptivité envers les hygiénistes dentaires qui se sont offertes pour contribuer à un excellent programme. Nous anticipons une autre belle occasion de développement professionnel, à St. John's (Terre-Neuve et Labrador), en juin 2004.

D'ici là, l'ACHD continuera à vous aider à élargir vos horizons en encourageant la recherche sur les questions d'hygiène dentaire, en faisant la défense d'une amélioration de

**Vers 8 heures, avec
la collaboration de
plusieurs
participantes, nous
avons un nouveau
programme pour
la journée.**

l'accès aux services d'hygiène dentaire et du remboursement pour les soins des hygiénistes dentaires; aussi, en vous dispensant l'information du jour concernant votre profession, et en aidant à développer des outils de connaissance pour favoriser une pratique dans divers milieux avec avec responsabilisation par l'auto-réglementation dans toutes les compétences territoriales du Canada. Si vous ne l'avez pas encore fait, je vous encourage à participer en ligne, dans la section réservée aux membres, à y faire des recherches et de l'affichage dans notre calendrier d'activités, à parcourir la base de données sur les emplois; à y chercher vos collègues — ou d'autres membres de l'ACHD que nous ne connaissez pas encore mais qui peuvent avoir des compétences à partager — et à surveiller les alertes-courriels vous informant de ce qu'il y a de neuf. 📧



212 Taking the Bite Out of Nutrition for Dental Health

by Helen MacDonald, RD, MSc, FDC

The following is based on a presentation at the CDHA conference in Regina in June 2003.



I'm delighted to be here today to address a topic near and dear to my heart—and I hope to your's: nutrition. To be perfectly honest with you (and I can't be otherwise), in preparing for a talk such as this, it strikes me that there is not much point in going over nutrition concepts that you've heard a hundred times before and, in all likelihood, know nearly as well, or as well, as I do. I'm sure you don't need me or any nutritionist to extol the virtues of *Canada's Food Guide to Healthy Eating* or to remind you to eat lots of fruits and vegetables or to keep your intake of deep-fried foods to a minimum.

What I have thought you might find useful, however, is a discussion of the role of diet in dental health and an exploration of the many myths that abound in the area of nutrition. As it happens, both of these areas concern milk and milk products: there is no single food or food group shown to be more important for the development and maintenance of healthy teeth than milk and milk products; and there is no food or food group about which there is more mythology and controversy as the milk product group. So that's why you'll hear a lot today about milk. It's not because I'm employed in the dairy industry but because it's one of the topics in nutrition that generates the most interest ... and misunderstanding.

To begin with, we'll cover an area that I suspect, and hope, most of you are very familiar with already: the role of milk products, especially cheese, in reducing the incidence of dental caries.

Even kids know that calcium in milk helps build strong teeth, but the role of milk fat is substantially less well known. Dairy fat coats the teeth, decreasing the amount of fermentable carbohydrate retained in the mouth and preventing acid from reaching the plaque.¹ Dairy fat also inhibits oral bacterial colonization.² But mounting evidence of the benefits of cheese is even more compelling. Cheese stimulates saliva, releases calcium, and reduces the phosphate in oral fluids.³⁻⁵ In fact, various studies show that cheese is instrumental in helping to prevent coronal^{4,6} and root caries.⁷ While the release of calcium from cheese and its diffusion into plaque may be its most important anticariogenic effect,⁴ there's more. Cheese increases salivary secretion—not just while eating it but for a good five minutes thereafter—and alters the composition of saliva, buffering plaque pH and increasing the rate of sugar clearance.^{3,8}

So, while there is ample evidence that milk, yogurt, and cheese are excellent ammunition in the war against cavities, the advice to include cheese in a balanced diet is often met with the argument consisting of a three-letter word: FAT, and worse than that, saturated fat.

Aside from the fact that there are many low-fat and fat-free versions of milk and milk products, there is the very real evidence that the alleged villainy of dairy fat has been exaggerated. Let me make it clear at the outset that I believe an excess of fat is a bad idea for everyone and that certain individuals at increased risk for heart disease should restrict their intake of animal fats and trans fats. For the majority of healthy individuals, however, the consumption of moderate amounts of dairy fat is not only not a bad thing, it can actually have a positive role because of the anticarcinogen, CLA or conjugated linoleic acid, that it contains.

Does dairy fat contain saturated fatty acids? Absolutely. Do they all increase blood levels of LDL—the bad cholesterol? Not by a long shot. Yes, certain of milk fat's fatty acids (myristic acid for one) will raise LDLs but others are actually neutral, will lower total cholesterol, or will raise the level of

good cholesterol HDL. As noted an authority as Walter Willett of Harvard University's School of Nutrition has stated that because of this counterbalancing effect, animal fats are possibly neutral in terms of heart disease.⁹ Other researchers^{10,11,12,13} have shown that butter and/or milk fat either do not contribute to increased risk of heart disease or, in fact, can lower the risk. There is much evidence^{14,15,16} that in cultures where animal fat and protein are consumed in moderate amounts, risk of hypertension and stroke are reduced.

So then, to sum up this section, while nobody (including me) would recommend one have a pound of cheese or butter per day, the idea that having these foods as part of a healthy diet will lead to heart disease is unfounded. In fact, the evidence that butter's substitute, hydrogenated margarines and shortenings, is conducive to heart disease is much more compelling.^{17,18}

All right then, if we accept the idea that having milk/milk products in the diet is good for dental health and not bad for heart health, what other reasons are there for including them, and why does Health Canada recommend two to four servings per day?

Osteoporosis

Osteoporosis affects one white woman in every four over the age of 50 and one in eight men that age—approximately 1.5 million Canadians. That number could be halved if calcium and vitamin D sufficiency were assured.¹⁹ Low calcium intake increases the risk of osteoporosis by reducing peak bone mass achieved during growth and by causing or aggravating age-related bone loss later in life.²⁰ Since peak bone mass is obtained by the time we reach our twenties,²¹ adequate intake of dietary calcium during childhood and adolescence is essential. Unlike the transient benefits of calcium supplementation,^{22,23} dairy intake during childhood has demonstrated persistent, long-term benefits to bone.^{24,25} Children who avoid milk may reach adulthood with low peak bone mass, making them more vulnerable to osteoporotic fractures later on. In fact, data from the Third National Health and Nutrition Examination Survey or NHANES III (n=3,251 women) indicated that, among women aged 20 to 49 years, bone mineral content was 5.6% lower for those who consumed less than one serving of milk/week during childhood (5-12 yrs) than in those who consumed at least one serving/day.²⁵ Among women 50+ years, low milk intake during childhood was associated with a two-fold greater risk of fracture.⁷ In addition to calcium, milk provides protein, phosphorus, vitamin D, zinc, and magnesium; all are important for the production of bone matrix and may have positive effects on bone growth and mineralization.²⁵

Colon cancer

The second most common cause of cancer death in the Western world, colon cancer owes more to environmental and lifestyle factors than genetics. There is strong evidence of an inverse relationship between dietary calcium consumption and colon cancer incidence. Extra calcium and vitamin D added to the diets of rodents exposed to potent carcino-

gens or fed Western-style diets (i.e., high in fat, low in calcium and vitamin D) have been shown to reduce colon tumour formation. Moreover, excellent epidemiological data suggest that increasing dietary calcium intake—principally from milk products—is accompanied by lowered rates of colon cancer and colon polyp formation in humans. Human studies have demonstrated that consumption of dairy products adding only about 850 mg/day of calcium is associated with very significant changes in proliferative and differentiation markers of colorectal cancer risk, converting them from higher risk to lower risk patterns. Non-dietary calcium supplements are less effective than dairy calcium since at least 1,200 to 2,000 mg/day are needed to achieve similar improvements.²⁶

Breast cancer

A large-scale prospective cohort study from Norway (n=48,844) has demonstrated that milk consumption during both childhood and adulthood substantially reduces the incidence of breast cancer in premenopausal women.²⁷ And the more milk, the better. Childhood milk consumption was inversely associated with breast cancer, although not significantly, while adult consumption of 450 grams of milk/day—the equivalent of just under two glasses—resulted in a 44% lower incidence rate of breast cancer compared with non-milk consumption (p for trend = 0.12). When childhood and adult milk-drinking habits were combined, a clear inverse trend emerged in the incidence rate of premenopausal breast cancer with increasing milk consumption (p for trend = 0.03). Compared with women who reported no or low consumption of milk on both occasions, women with moderate milk consumption had a reduced incidence rate of breast cancer of about 25%, whereas women with high milk consumption on both occasions had a reduced incidence rate of about 50%. These findings may be due in part to milk's conjugated linoleic acid (CLA) content. CLA, a fatty acid derived mainly from dairy products, has been shown in animal studies to block tumour growth and metastasis to the breast.

Ovarian cancer

An investigation into the impact of diet on the development of ovarian cancer has led researchers in Hawaii and California to conclude that dairy intake is protective. In a case-control study, trained interviewers questioned 1,165 women about their diets. They found no significant differences between cases (588 ovarian-cancer patients) and controls (607 women with at least one intact ovary, matched for ethnicity, age, and study location) in crude or covariate-adjusted mean intakes of macronutrients, including fat, carbohydrate, and protein (regardless of their source). However, daily intake of milk products was found to be significantly lower among cases than among controls ($p = 0.0008$). Women with the highest dairy intake had a 41% lower risk of ovarian cancer than those with the lowest (p for trend = 0.003), whereas neither non-dairy calcium nor calcium supplementation appeared protective. The authors speculated that lower calcium bioavailability from plants (containing phytate, oxalate, and other compounds known to inhibit calcium absorption) might explain the discrepancy. Lactose was also found to be significantly inversely associated with the

risk of epithelial ovarian cancer, to the point that individual effects between calcium and lactose were difficult to distinguish.²⁸

Kidney stones

Contrary to popular opinion, high calcium intake does not increase the risk of developing kidney stones. In fact, the evidence is compelling that it actually reduces the risk. While most stones are composed of calcium-oxalate, it is the oxalate—not the calcium—that is chiefly responsible for stone formation. Since dietary calcium binds with oxalate in the intestine, thereby inhibiting its absorption, low-calcium diets could actually be harmful. Studies have shown that increased consumption of calcium-rich dairy products reduces the risk of kidney stones. The same protection has not been demonstrated with calcium supplements, perhaps because they are usually taken without food. Food is necessary if calcium is to bind with oxalates and offer protection against oxalate absorption.²⁹

Hypertension

Approximately 22% of Canadian adults are hypertensive and therefore at relatively greater risk of cardiovascular disease (particularly ischemic heart disease) and stroke. The Dietary Approaches to Stop Hypertension (DASH) study assessed the effects of dietary patterns on blood pressure. After consuming a control diet for three weeks, 459 adults were randomly assigned to either continuation of the control diet, a diet high in fruits and vegetables (8-10 servings), or a combination diet high in fruits and vegetables plus milk products (2.7 servings). Within two weeks, both test diets effectively lowered blood pressure in all participants. However, the dairy-enriched combination diet had double the impact of the fruits-and-vegetables diet, significantly reducing systolic blood pressure (SBP) by 5.5 mm Hg and diastolic blood pressure (DBP) by 3 mm Hg more than the control diet. The results were even more impressive for hypertensive individuals on the combination diet. Reductions in SBP of 11.4 mm Hg and in DBP of 5.5 mm Hg more than the control diet made the combination diet a viable alternative to single-agent therapy for milk hypertension. It is estimated that reductions in blood pressure of the magnitude achieved by the DASH combination diet could translate into a 15% reduction in ischemic heart disease and a 27% reduction in stroke.³⁰

Insulin resistance syndrome

Insulin resistance syndrome (IRS) is a constellation of multiple, interrelated conditions comprising obesity, impaired glucose metabolism, hypertension, and dyslipidemia (low serum HDL-cholesterol and high serum triglyceride concentrations). Estimated to affect approximately 25% of our adult population, IRS interferes with the body's ability to control blood sugar, thereby increasing one's risk of developing type 2 diabetes and cardiovascular disease. Since diet is a factor, the Coronary Artery Risk Development in Young Adults (CARDIA) Study investigated the independent effects of dairy consumption on the development of IRS. Dairy

intake (measured by diet history interview) was analyzed in 3,157 American adults aged 18 to 30 years followed from 1986 to 1996. The results indicated that overweight subjects (i.e., body mass index ≥ 25) with the lowest consumption of milk products (<1.5 servings/day) were at least three times more likely to develop IRS after 10 years than those with the highest dairy intake (≥ 5 servings/day), independently of other lifestyle factors and dietary variables, sex, age, and race. Each daily occasion of dairy consumption was associated with 21% lower odds of IRS. Moreover, no association was found between dairy consumption and high LDL-cholesterol, a major factor in cardiovascular disease, though not a component of IRS.³¹

Premenstrual syndrome, or PMS

Ample evidence exists that calcium-rich dairy products are the most effective dietary approach to alleviating the majority of mood and somatic symptoms associated with premenstrual syndrome (PMS). Women with luteal phase symptomatology appear to suffer from an underlying calcium dysregulation, suggesting that PMS is actually a manifestation of calcium deficiency that materializes following the rise of estrogen concentrations during the menstrual cycle. In fact, there are striking similarities between the symptoms of PMS and hypocalcemia. In numerous double-blind studies in which women with PMS were randomized to increased calcium—either in the form of 1,000 to 1,200 mg/day of calcium supplements or 1,336 mg/day of dietary calcium—or to placebo or low dietary calcium (587 mg/day), the high-calcium groups experienced significant improvements in mood, behaviour, pain, and water retention during the menstrual cycle. At least two investigations have also identified a relationship between PMS and bone loss, lending further support to the association between PMS and insufficient calcium intake.³²

Weight loss

Recent research demonstrates that increased intake of dairy products helps one lose weight where it counts—around the middle. Zemel and colleagues have shown that dietary calcium markedly accelerates adipocyte lipolysis, inhibits lipogenesis, and shifts energy partitioning from adipose to lean tissue, resulting in suppressions of fat accretion and weight gain and improvements in the metabolic profile.³³ In this group's studies of both mice and human subjects, dairy products were shown to exert a markedly greater effect than supplemental calcium. Their most recent trial involved 34 obese, but otherwise healthy, African-American adults, randomized to a low-calcium (500 mg/day)/low-dairy (<1 serving/day) or high-dairy (1,200 mg calcium/day; including 3 servings of dairy) diet with no change in calorie intake or total dietary fat, carbohydrate, or protein for 24 weeks.³³ The high-dairy diet produced a 26.5% increase in plasma glycerol ($p<0.01$), reflecting an increase in lipolysis. Moreover, the high-dairy group achieved significant decreases in total body fat, trunk fat, insulin, and systolic blood pressure, and an increase in lean mass.³³ There were no significant changes in any of these parameters in the low-dairy group.

In addition to calcium, milk products have an abundance of high-quality protein. Studies comparing the impact of diets with ratios of carbohydrate/protein of 3.5 vs. 1.5 and with protein intakes of 0.8 or 1.5 g/kg indicate that diets with increased protein and reduced carbohydrate partition weight loss toward a body fat while sparing lean body mass.³⁴

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Expanding the Horizons of Dental Hygiene

During CDHA's 14th Annual Conference in Regina in June 2003, Executive Director Susan Ziebarth examined the need for leadership in dental hygiene. This article is based on her presentation.



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New vistas for personal and professional growth

During the past year, the Association has been dealing not only with new ideas, information, and techniques in dental hygiene, but also with major developments in legislation, self-regulation, and oral health-care delivery for our profession. While I am confident that these will ultimately lead to much broader personal and professional horizons for our membership, they do raise challenges for us to overcome. During the Annual Conference, I brought several such developments to the attention of the Association's members, and it is in this context that I want to examine the future of leadership in the dental hygiene profession.

The lesson of the slime mould

Oddly enough, there is a very primitive organism that can give human beings a lesson in organizational leadership. It is called a slime mould, and according to David O. Weber,¹ there is a connection between slime moulds and human organizations such as the CDHA. Both are *complex adaptive systems*, and the humble mould, oddly enough, helps us understand how such systems behave.

Just as a health-care organization is composed of individual humans, the mould is composed of individual cells. In both cases these individuals are free to behave in ways that are *generally* predictable but *specifically* unpredictable. The behaviour that results, whether it is that of the mould creeping over a leaf or CDHA beginning a new initiative, is based on the collective outcome of many autonomous, individual decisions.

Weber also examines the features of complex adaptive systems and what this suggests about leadership within them. In such systems, the following features exist:

- The agenda of one individual always changes the context in which others respond. For example, if scaling is approved for dental assistants in New Brunswick, this changes the context in which all Canadian dental hygienists work.
- The whole is greater than the sum of its parts. Many of these systems, like the slime mould, function purposefully to achieve goals that are beyond the reach of any

single member. They achieve this by using a few simple rules that, when followed by each individual, produce very complicated behaviours in the system as a whole.

- There is a natural ability for self-organization and behavioural evolution that can provide stability and innovation at the same time. For example, CDHA is composed of people whose common interest pulls them together but whose individual agendas can pull them apart. Our system manages this by setting stable goals toward which we move and by evolving a governance structure that allows us to change and adjust our behaviour as we go along, thus setting up an ongoing process of improvement. Slime moulds, in their miniature way, do the same thing.
- Evidence-based decision-making is needed to establish a balance between stability and crisis. Leaning too much to one side or the other is unhealthy in an organization; deeply entrenched stability means the system cannot change when it needs to, while too much crisis can lead to disintegration.

The first lesson we can learn from the slime mould, then, is that each individual in a complex adaptive system is as important as any other. But the second lesson is even more significant, because it is about synergy. It shows that by working together, individuals can achieve much bigger things than they could if they worked alone. And as a result, everyone benefits in ways that would be impossible for them as individuals.

Organization at the edge of chaos

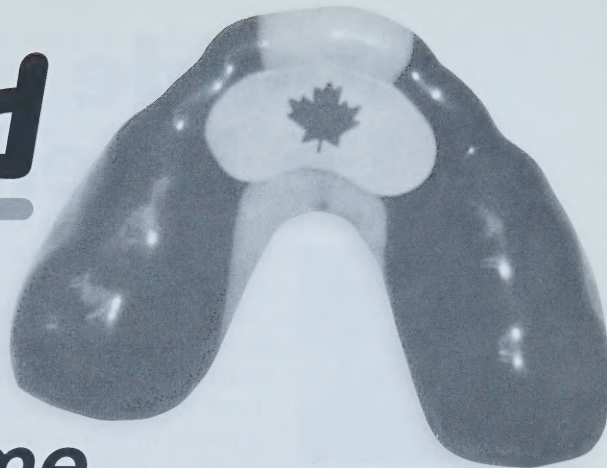
When under pressure, living systems move toward the edge of chaos, displaying more mutation and innovation. They also exhibit self-organization and emergent behaviours. For example, a few bacteria on your teeth may be easy to remove, but if their numbers reach a critical mass, they signal to each other and, like the slime mould, organize themselves. When this happens, they become pillars that require debridement by a dental hygienist.

Adaptation is so necessary that a too-entrenched stability can be detrimental to both living things and organizations. This argument is made by Joe Flower and Patrice

Mouthguard Program

– Origins and Outcome

by Dean Lefebvre



My mouthguard business had its origins during my dental hygiene studies in the mid-1990s at the Saskatchewan Institute of Applied Science and Technology (SIAST). I had organized a mouthguard clinic as part of a Community Oral Health project and it

was a huge success: over 100 mouthguards were fabricated for a variety of different athletes. I was pleased when my efforts earned me the CDHA Aquafresh Student Scholarship. Following graduation, I continued to give presentations to different organizations and to make mouthguards in private practice. After a major local hockey organization asked me to give a series of mouthguard presentations, it was clear to me that a serious need existed for such a program.

In 1999, I met with a business consultant to investigate what needed to be done to start my own business. Research and planning are crucial for developing a successful business plan. According to Canadian statistics, one-third of all businesses fail in the first year, one-half have failed after two years, and two-thirds after three years. I then consulted a lawyer to see what guidelines had to be followed in accordance with the Health Act. In Saskatchewan, a dental hygienist must be employed by a dentist or someone who has a formal consultation process with a dentist. Fortunately, the dentist I work with in private practice agreed to be my consulting dentist. It was now time to register and license the business, Regina Preventative Dental Services. To keep overhead costs down, I decided to run my business out of my home. I built a lab in my basement and purchased all of the necessary equipment and supplies. My business plan had a strong foundation. However, I still had to decide how I was going to run it.

The mission statement of my business is to provide affordable, convenient, custom-made mouthguards of top quality for all sports. To achieve this, I take the impression in the athlete's home because children (who make up most of my clientele) are more comfortable in this situation. As well, the parents appreciate not having to drive to an office for an appointment. Since I am the one taking the impression and fabricating the mouthguard, I am aware of any unusual cir-

cumstances that may influence the fit of the mouthguard. It also allows me to further educate parents and athletes on the importance of mouthguard use.

The positive feedback I have received has been great! Dentists have been supportive of my endeavours and have referred clients to me. One case that had the biggest impact on me was Victor's. Victor is a 10-year-old boy with a health condition that has delayed his development. He has an extremely small mouth with limited opening. Store-bought mouthguards were too big for him and the smallest available impression tray would not fit in his mouth. Since mouthguards are mandatory in hockey, Victor was therefore unable to play a sport he loved. A custom-made mouthguard was his only option, but taking the impression presented quite a challenge. While I was at work one day administering a fluoride treatment to a client, it came to me. A child-sized fluoride tray is flexible, small, and holds material! So I made the impression (and the mouthguard of course!) and Victor could play hockey. I fabricate on average over 150 mouthguards each year, focusing on the hockey season. I continue to educate parents, coaches, and athletes on the importance of mouthguard use in sports.

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Don't forget the following important dates:

**International Dental Hygienists' Day
– Wednesday, October 8, 2003**

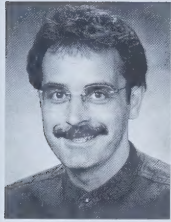
The IFDH has established an international day focusing on Dental Hygiene to be celebrated annually around the world. This year's theme
– smoking cessation.



National Dental Hygienists Week™
La semaine nationale des hygiénistes dentaires

October 12 – 18, 2003

Donde Le Duele



by Amil Shapka

At the CDHA conference in June, Dr. Shapka gave a moving overview of his Canadian registered non-profit charity, Kindness In Action, that brings dental care to those in the developing world. Information, stories, and photographs can be perused on his web site at www.kindnessinaction.ca and Dr. Shapka can be reached at docdoc1@hotmail.com.

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Children waiting for us at satellite clinic #2



Gretta's extra Crest SpinBrush is somewhere in the Andes mountains

by Donna Kittle, RDH, BSC, volunteer with Kindness In Action

olé, olé

Kicking, screaming, and crying, he lifted himself up from the makeshift table and left pushing through the thick crowd gathered around him. One hour later, the 11-year old quietly walked up to Neil Applebaum's empty table, jumped on and nervously opened his rotten, smelly, decayed mouth. Later with a huge white cotton gauze in his mouth, Carlos left with six fewer teeth.

Having the assistance of six smiling Team II-Peru Kindness In Action volunteers, he picked out a next-to-new pair of shoes, clean T-shirt, new baseball hat, and the much treasured soccer ball. Finally it was a-win-win situation.

Kindness In Action, or KIA, is a non-religious and non-political charity and consists of dental professionals and volunteers. The silver thread uniting all the volunteers is the desire to help those with less in the developing world. The belief in the dignity of all people, including their right to basic human needs, is strong among the members. The volunteers work without compensation and are responsible for their own airfare and accommodation.

Ten dental mission groups travelled to Central and South America in 2003, delivering free basic bare-bones dentistry including extractions, cleanings, simple fillings, and oral health education. Over 200 volunteers made the annual crusade to Honduras (1 team), Nicaragua (3 teams), Guatemala (4 teams), and Peru (2 teams) treating approximately 3,648 patients. Statistics include:

- 6,300 extractions
- 1,839 fillings
- 850 cleanings
- 136 new dentures processed
- 7 root canals

Hooman Menshari is a management consultant from Toronto, and with Team II-Peru, a first-time "go-fer." This volunteer said "I felt useful. We started from nothing . . . our team of 26 was a mix of old and young . . . everyone working together and collaborating all of our skills. . . . I was surprised how dynamic and effective we were, working up the mountain in the back of a church with very little. I was all charged up and ready to go again after the trip."

This was the charity's first project in Peru. Amil Shapka, originator and head guru, said, "Leave your expectations at home, pack extra smiles and a sense of humour." Stoic Sister Maria, our chief, speaking only French and Spanish, greeted us at the airport. A woman who has her own school, owns her own school bus in Lima, and drives like Mario Andretti, deserves respect. Our job was to fix teeth and eliminate pain; Sister Maria's was to pray. Our adventures started at Customs in Lima. Custom officials wanted to charge us for our own luggage (medical and dental supplies, and equipment) and wanted us to produce an official document, which we didn't have.

Highlights of Team II-Peru dental mission in the poor community of Comos

Precious accommodation! The English translation of our hostel was "Sins of the Friar"—my first brothel experience. McBreakfast, 3 black olives in a huge white bun with mar-

velous mango shakes. Cheerful students from the school who assisted us. Luis, the man who volunteered to help us, carrying his own white dental smock, became one of our dental educators. The collaboration of east and west Canada that made it possible to distribute 500 pairs of shoes to our needy patients after dental service was completed. An East Indian pilot from Ontario with limited Spanish became the main translator for two days in one of our satellite clinics, since he knew more Spanish than anyone else. A spunky young hygienist from Winnipeg who snuck into kindergarten and grade 1 classrooms and gave toothbrush demonstrations in Spanish. Finally, Sister Maria's ceremony and presentation of Peruvian hats to each of us.

We arrived to the sounds of silence in our barrio: no birds, no breeze, no flowers, no trees, just dust and dirt all around. We left hearing healthy, happy campesinos cheering. We were planting the seeds for next year. Sister Maria promises to learn a little English and perhaps in the future, we can start a community-based preventive program, which will include fluoride rinses, varnishes (as is piloting this year in Chajul Guatemala), or build a KIA-sponsored primary school as is scheduled this year in XIX (pronounced sheesh), Guatemala.

Making a difference

We do make a difference through our combined service *together*. Some are gatherers, for example a wonderful hygienist from Calgary who found 18 soccer balls to be distributed in Peru; at this moment a little boy named Carlos is playing with a soccer ball everyday. Some are the workers, some the deliverers, some provide the cash, and some provide the services and supplies. Our growth brings added responsibilities and expenses. Plans for 2004 include 14 missions to Honduras, Guatemala, Nicaragua, Peru, Mexico, Belize, and Thailand—250 volunteers are needed. We require thousands of toothbrushes, repairs to our equipment, and perhaps the purchase of a portable unit and generator (about \$10,000). Each mission costs about \$7,500 a week.

Take a step on the wild side and join us. I'm looking forward to working with you on the next trip! 

Gifts from Sister Maria



Kate MacDonald,

by Dennis Jones

RDH, BS, MEd

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Kate MacDonald was among the very first dental hygienists ever to practise in Canada. She was involved in the earliest fluoridation projects both in her home province of Prince Edward Island and in Ontario. In fact, for a time, she was the only dental hygienist in Ottawa. She has seen her profession grow from a tiny handful of practitioners into the many thousands of members it has today. She is, in a word, a pioneer.

In 1951, Ms. MacDonald began her professional training at Boston's Forsyth School for Dental Hygienists. After returning to Canada in 1953, she worked for three years in the Dental Division of the Prince Edward Island Department of Health. She then joined a private practice in Ottawa but in 1961 returned to public health as a hygienist for what was then the National Department of Health and Welfare.

The year 1964 saw her back in the Maritimes, working as an instructor in dental hygiene at Dalhousie University. She taught there for four years and then went to the United States to be an assistant professor at the School of Dental Hygiene at Old Dominion University in Virginia.

On her return to Canada in 1969, Ms. MacDonald accepted the directorship of Dalhousie University's School of Dental Hygiene and remained at Dalhousie until her retirement in 1997. During her long career, she published many professional articles, was a presenter at several international symposia, and was a member of numerous professional organizations and committees dealing with dental hygiene. She has also served as Dalhousie's Director of Continuing Education and as its Coordinator of Alumni Affairs. She is a Life Member of both the Canadian Dental Hygienists Association and the Nova Scotia Dental Hygienists Association and has been listed in *The International Who's Who in Education* and in *The World Who's Who of Women*.

We talked with Ms. MacDonald about her early days in dental hygiene, about its present status, and about her hopes for the profession's future.

Q: You were among the pioneers in dental hygiene in Canada, and you worked and taught in the profession for 44 years. Can you give us an idea of what it was like when dental hygiene was just getting started in Prince Edward Island?

Those early days were quite unique. When I began working in Prince Edward Island in 1953, there were just three



hygienists on the whole island—me, Catherine Smith, and Joan Rogerson, and for the most part we operated as a team.

Our education, at the Forsyth School for Dental Hygienists in Boston, had prepared us to work in private practice, because that was the trend in the U.S. at

the time. But it wasn't so at home—in Canada, dental hygienists worked primarily in public health, so we had to learn about public health as we went along. It was strictly trial and error, but the job offered lots of interesting variety.

We had a school health education program where we visited rural schools. The majority of these had one room, two at the most, and they were *everywhere*—there was a school every two miles. We had to use aerial survey maps to locate them, and even at that we still got lost and sometimes ended up at the same school twice in the same day. We used to spend days in the office putting dots on the maps to match each school. There were all sorts of strange things like that.

Being in Prince Edward Island, of course, what we did at certain times of the year was weather-related. The Trans-Canada Highway was just being built, so the roads were very muddy and hard to negotiate in the late fall and early spring. We got stuck many times!

Q: This was around the time that water fluoridation was getting started in Canada, wasn't it?

Yes, it was. In summer, in the larger towns, we had clinics for the application of fluoride. Part of the year, we'd also have a clinic in Charlottetown's city hall. We were quite a novelty there, what with all the kids running around. We also did the demographic surveys for the pre-fluoridation surveys in Summerside and Charlottetown, along with some of the statistical analysis of the data. That was totally new to us as well and it was all very interesting.

There was also a dentist travelling around to various places while we were operating these clinics, and we decided that the fluoride treatments should be a reward rather than something everyone got automatically. Patients needed a signed certificate saying that their dental work had been completed, and then they could have the fluoride treatment.

This meant that children were getting more dental care than they'd ever had before. It was the same in the school pro-

grams where we were doing the demographic surveys. When we discovered children with carious teeth, we sent cards home to the parents, so the parents could take the children to their own dentists or to a public health clinic.

Q: *The profession must be quite different now from the way it was when you began. What particular changes have you seen?*

There's more emphasis on private practice now, and dental hygienists often specialize in what they do, depending on their workplace. And, of course, the resources are better. We didn't have ultrasonics when I was a student, for example. When ultrasonics first came out, I was working in a periodontal practice and the periodontists learned how to use ultrasonics by practising on pig jaws. But they didn't think that a hygienist should be allowed to do that, so I never got my hands on a Cavitron.

But the biggest change of all has been fluoridation. It's led to a much lower incidence of dental caries in Canada. When we worked in Prince Edward Island, the average caries incidence was 10 decayed teeth per child. But then the children's dental programs came in, as well as fluoride in community water supplies and the education that went along with it, and children began growing up caries-free. Topical fluoride was really quite a boon, too.

Q: *In those early days, how were dental hygienists perceived by others in the oral health care profession?*

Prince Edward Island has always had a pretty good rapport with our profession, and the dentists we came into contact with were in favour of dental hygienists. They liked us because we were very useful and sent them patients who might never see a dentist otherwise. We got along fairly well in those three years and had no major problems.

I do think that sometimes, in the beginning, the dentists were a bit wary—they were afraid that their patients might not want to be treated by a hygienist. But that turned out not to be the case, because patients usually seemed to enjoy the experience and would comment on how gentle the hygienist was. The result was that any wariness on the dentists' part was soon overcome.

Q: *Speaking of changing perceptions . . . Since you were first in practice, how has the perception of the dental hygiene profession changed among the public?*

At that time, the public had absolutely no knowledge of what a dental hygienist was or what we did, so we had to explain it to the patients. We also wore uniforms and caps, so we were immediately identifiable in the office just by our garb.

But these days, I've heard people say they can't tell the dentist or the dental hygienist from the person who cleans the office. I don't think that any explanation is necessary now, because everybody knows who hygienists are and what they do.

Q: *Given all that you've done, it's clear that you've been very prominent in your field for a long time. Was this a long-range plan on your part?*

Well, I was only 16 when I started at Prince of Wales College

in Charlottetown. I was putting in time, really, until I was 18 and would be old enough to do something. I did know that I wanted to be in a health profession, but I wasn't sure which one. So I decided that an education in commerce might be helpful to have, and because of that I got a Diploma in Commerce.

I think it was the registrar who gave me two classes off to go and see the dental director, Dr. Brian O'Meara. He was looking for people to go to the Forsyth School, and the government was prepared to provide bursaries. I thought: Well, this looks worthwhile. And off I went.

Forsyth was a really interesting school. There were 75 of us, a large class. We were affiliated with Tufts University, so we did our basic science courses at Tufts and our clinical and dental hygiene-related courses at Forsyth. It was a good experience and we all loved Boston.

Starting in 1956, I worked for about three years for a periodontist in Ottawa, and at the time I was the only hygienist in the city. Later I was at National Health and Welfare for several years. It wasn't as active a job as the public health experience had been in Prince Edward Island, but we did work on the Brantford-Stratford-Sarnia fluoridation project. I began writing there—we published newsletters, and I helped design posters, brochures, and general materials for dental health education.

After I left National Health and Welfare, I went to Dalhousie University as an instructor. Four years later, they offered me the directorship of the School of Dental Hygiene, but I didn't think I was ready for it. I decided maybe I'd try someplace else, so I went to Old Dominion University in Virginia. I gained a lot of experience at Old Dominion, so when the Dalhousie directorship was offered to me again, I accepted it and stayed at Dalhousie for the rest of my career.

Q: *You have always been a leader in your profession. Did you in your turn have mentors and models to whom you looked for inspiration and guidance?*

I don't think I set out to be a leader, but I had a lot of interesting and lucky breaks. I've had the enjoyment of working with people who have been pioneers.

One was my first mentor, Dr. Brian O'Meara, who had such a vision for Prince Edward Island. He not only paved the way for fluoridation in Charlottetown and Summerside, but he also gave rural residents equal access to fluoride clinics and made it possible for children to have dental treatment for a very nominal fee.

He was a very interesting person to work for and he had a lot of trust in hygienists. We could go off and set up clinics in the summer and practically never see him, which was amazing in those days. He didn't feel he had to be on our doorstep every day, and I thought that having so much faith in us was certainly to his credit.

In later years, long after I left, he set up orthodontic clinics in Prince Edward Island, and I remember talking to him about them. He said, "Well, they're not going to be anything too spectacular, we will just do simple orthodontics that will make people presentable." I thought that was such a good philosophy.

My educator mentor was Janet Burnham, the first Director of the School of Dental Hygiene at Dalhousie. When I arrived, I knew absolutely nothing about teaching and she was very helpful. She had vision, too—she could see the big picture and she liked a challenge. Unfortunately, the year after I came to Dalhousie, she went off to start a new dental hygiene program in one of the Midwestern states and later went to work for the American Association of Dental Schools.

I could always get in touch with her, though, and she also introduced me to networking in dental hygiene. That was a very positive thing, because she introduced me to the national meetings that were of utmost importance, and I met people who were really doing things. It was a great experience knowing her.

And then there was Dr. Harry Brown, Chief Dental Consultant for National Health and Welfare. His work in the fluoridation studies was quite outstanding. I often recorded for him when he was examining children. He did it very swiftly and purposefully, because he felt that you didn't spend any longer on one person than on another or it would skew the results. He really was a good researcher.

Q: Since you entered the profession, there have been major changes in the way dental hygienists are educated. Can you give us a sketch of how they've come about?

There's actually been a lot of variation over the years. The prerequisites at Dalhousie changed several times during the time I was there, for example. At first, the entrance requirement was senior matriculation, which was Grade 11, and later it became Grade 12. There were several other changes after that, but now Dalhousie has a year of university as a prerequisite.

Then there was the Banff Conference on Dental Auxiliaries in 1974. That's where the ladder concept was developed, where the hygienist began as a dental assistant and then had another year of training to become a dental hygienist. This format changed a while ago to the current direct-entry, two-year program. There are now some degree programs in dental hygiene in Canada, and Dalhousie also has faculty approval for a baccalaureate program, although there are still hurdles to be overcome before it becomes a reality.

There has also been a big shift in that dental hygiene is now taught not only in universities, but also in community colleges, and many colleges are now articulating with universities for degree completion. As I said, there's a lot of variation.

Q: Do you think that dental hygiene will ever achieve the full professional status it deserves, and how do you think the profession can move most effectively toward that status?

I think it's well on its way, because it's moving from hygienists being technology appliers to being knowledge workers. That's really the aim of most dental hygiene programs, and my belief is that education can probably get you almost anywhere. It has certainly contributed to the profession's current status and will continue to do so, especially when the baccalaureate entry level for the profession is in place. Research

efforts are also continuing, and these are building up a body of knowledge that is one of the requisites for a profession.

So education and research are the two important areas. Also, government lobbying doesn't hurt at all. In Quebec, the government determined the status of the hygienists there, so that they just slid into professional status and were recognized as professionals. Unfortunately, it's not so simple in the rest of the world. But certainly the growing educational and knowledge base is leading to hygienists being seen as professionals.

Q: The profession has met and overcome significant challenges in the past. What is the major challenge you see as facing the profession today?

I think it's establishing the proposed baccalaureate entry level for the profession and getting it in place across the country. It's not an easy thing to do, but I think it's something that has to happen.

Q: There's been some debate as to whether dental hygiene is a technical vocation or a profession. What do you envision as the ideal perception of dental hygiene in the future?

I think this comes down to professionalism and education. Every once in a while, there's a movement to recognize only technical skills. It reinvents itself every few years, when there's a perception that there's a shortage of hygienists. But hygienists, as I said earlier, are moving from being technology appliers to knowledge workers, and that is certainly the perception we want for our profession.

Q: The Canadian health care system seems to be moving into a time of considerable change. Do you see opportunities here for dental hygienists?

If there is an emphasis on better health in general, I'd expect hygienists to be at the forefront, offering preventive dental care and other health care services to promote healthier lifestyles.

Q: How do you think this aging of the Canadian population will affect the work of dental hygienists?

As I said, older people are still going to need dental hygiene care, and I think that hygienists will have to operate more in institutions to satisfy that need. To do so, they will have to be under no supervision or under indirect supervision, because it will not usually be possible to bring in a whole team of dental health professionals. Supervision has been a problem right from day one for hygienists, but I think they can work collaboratively with the dentists, provided they're allowed to provide care in institutional settings. Self-regulation is an important issue, and currently over 90 per cent of the country's hygienists are self-regulated. Only the Atlantic provinces and Manitoba do not have self-regulation, and with self-regulation, more indirect supervision will be possible, an absolute necessity if hygienists are to provide care in settings such as nursing homes.

Q: Given these changes, do you think there will be enough dental hygienists to meet the demand on the profession?

The schools are producing fairly adequate numbers now, I think. There are also hygienists who have given up practice for one reason or another. It's an easy profession to get back

into, with a refresher course, and people have the option of working a few hours or days a week. So I think there are untapped resources out there, people who would probably be willing to return to the profession. But we do have to provide effective re-entry programs to help them come back.

Q: What do you see as the CDHA's role in meeting this range of challenges?

The CDHA has always been supportive and has always advocated higher education. They've established active committees and have done a lot of work helping provinces achieve

self-regulation, so I think they'll be there when they're needed.

Q: To conclude, what advice would you have for those working in the dental hygiene profession now, and for those who may be thinking of entering it?

The profession offers many opportunities and it certainly has been good to me. It's so interesting because you can have several different careers in your lifetime, all within dental hygiene. And best of all, the variety is increasing all the time. 

Notice

Notice of Annual Meeting of Members of Canadian Dental Hygienists Association (CDHA)

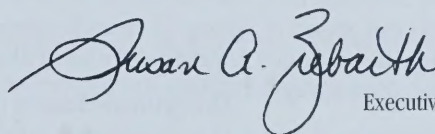
NOTICE is hereby given that the annual meeting of the members of CANADIAN DENTAL HYGIENISTS ASSOCIATION will be held at Les Suites Hotel, 130 Besserer Street at Ottawa, Ontario, on Saturday the 25th day of October, 2003, at the hour of 9:00 o'clock in the forenoon, to:

- I. receive the financial statement of the corporation for the fiscal period ended April 30, 2003, and the report of the auditors thereon;
- II. appoint auditors and authorize the directors to fix the remuneration of the auditors; and
- III. transact such further and other business as may properly brought before the meeting or any adjournment thereof.

Copies of the financial statements and the auditors' report are available for review at the corporation's head office during normal business hours.

DATED the 15th day of September, 2003.

BY THE ORDER OF THE BOARD OF DIRECTORS



Executive Director

Avis

Avis de convocation de l'assemblée annuelle des membres de l'association canadienne des hygiénistes dentaires (ACHD)

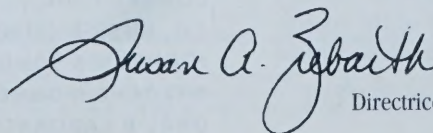
AVIS est par les présentes donné que l'assemblée annuelle des membres de L'ASSOCIATION CANADIENNE DES HYGIÉNISTES DENTAIRES aura lieu à l'Hôtel Les Suites au 130, rue Besserer, à Ottawa (Ontario) le samedi 25 octobre 2003, à neuf heures. En voici l'ordre du jour:

- I. recevoir l'état financier de l'Association pour l'exercice ayant pris fin le 30 avril 2003 et le rapport des vérificateurs à ce sujet;
- II. nommer les vérificateurs et autoriser les administrateurs à fixer la rémunération des vérificateurs;
- III. régler toute autre question dûment soulevée à l'assemblée annuelle ou à toute nouvelle assemblée convoquée en cas d'ajournement de l'assemblée annuelle.

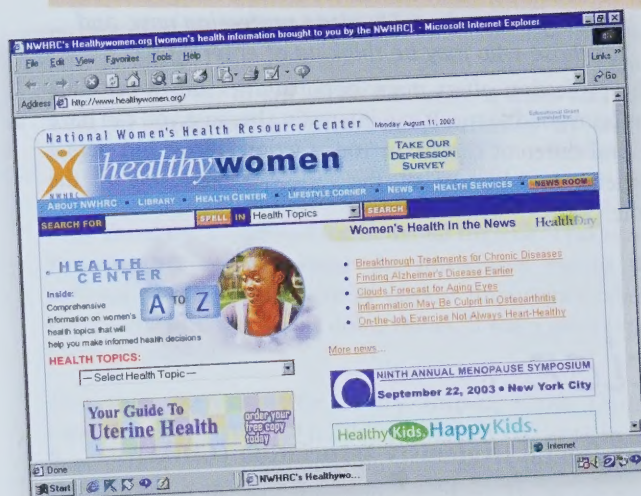
Des exemplaires des états financiers et du rapport des vérificateurs peuvent être examinés au siège social de l'Association pendant les heures d'affaires ordinaires.

FAIT le 15 septembre 2003.

PAR DÉCRET DU CONSEIL D'ADMINISTRATION



Directrice générale



by Karen Wolf, DipDH

Hello again—I trust you all have had an enjoyable summer with plenty of memories to carry you through our Canadian winter. Learning how to play can be almost as challenging as learning how to work. Our mental health, however, deserves a whole-hearted effort in this regard.

I was fortunate to be able to attend the national conference of the American Dental Hygienists' Association in late June in New York City. Here I went to a course on Women's Wellness presented by Janis Keating, RDH, MA. This presentation was so well referenced that I would like to pass on some of the web-based resources for you to access for either professional or personal information.

National Women's Health Resource Center (www.healthwomen.org)

"The non-profit organization, dedicated to helping women make informed decisions about their health, encourages women to embrace healthy lifestyles to promote wellness and prevent disease. As the national clearinghouse for women's health information, providing access to health information and resources is our primary goal. The information we provide is comprehensive, objective, and supported by an advisory council comprised of the nation's leading medical and health experts."

This site has many interesting sections but in the *Health Center* under "Oral Health," I discovered this interesting reminder about oral contraceptives: "One of the most common problems in women who take oral contraceptives is hormonal gingivitis. The inflamed gums become swollen, red and bleed easily. The hormone progesterone in oral contraceptives can make your gum tissue more sensitive to irritants in the mouth, such as food or plaque. Remember, if you are taking oral contraceptives, and need to take an antibiotic, the antibiotic may interfere with the efficacy of the contraceptive. Other methods of birth control are advised while taking the antibiotic."

In the *Library* section, books and other materials are arranged under different health categories. Brief summaries help you decide if you want to buy the item and you can buy it through this site.

In the *Lifestyle Corner*, Dr. Pamela Peeke writes a weekly column on a variety of health and wellness issues for women.

Society for Women's Health Research (www.womens-health.org)

This society "is the only nonprofit advocacy group whose sole mission is to improve the health of women through research." "In 1995 the Society provided the framework for the discipline of 'sex-based biology,' a research practice of analyzing the biological and physiological differences between men and women with regard to disease." One outcome of this research is a fascinating video on "sex-based biology" that would be ideal for helping educate both dental hygiene and high school students on the genetic differences between men and women and why each gender handles both health and disease differently.

At this site, you can browse through sections such as: *About Your Health*; *What Is Sex-based Bio?*; *Understanding Research*; *Funding Research*; and more.

These two sites are an invaluable resource for learning more about the topic of women's wellness. Additional sites for those of you who are interested in broadening your knowledge base are listed below:

The Arthritis Society (www.arthritis.ca)

Arthritis Foundation (www.arthritis.org)

Canadian Women's Health Network (www.cwhn.ca/indexeng.html)

Centers for Disease Control and Prevention, Oral Health Resources (www.cdc.gov/OralHealth/index.htm)

Centers for Disease Control and Prevention. *To Be or Not to Be—On Hormone Replacement Therapy. A Workbook to Help You Explore Your Options* (www.cdc.gov/nccddp/hrt.htm)

Until next time... 

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HYGIENISTS ASSOCIATION**

**L'ASSOCIATION CANADIENNE
DES HYGIÉNISTES DENTAIRE**



Meloche Monnex

**Where insurance is a science
...and service, an art**

[†]Group auto insurance rates are not applicable in the Atlantic provinces. Due to provincial legislation, our auto insurance program is not offered in British Columbia, Manitoba or Saskatchewan.

*No purchase necessary. The contest is open to residents of Canada who have reached the age of majority where they reside. The approximate value of the BMW 330Ci Cabriolet is \$63,000 (vehicle may not be identical to the one shown). The contest runs from January 1st to December 31, 2003. In order to win, the entrant, selected at random, must correctly answer a mathematical skill-testing question. For the odds of winning and to learn how you can participate, see the complete rules of the Win a BMW 330Ci Cabriolet Contest at www.melochemonnex.com.

The Meloche Monnex home and auto insurance program is underwritten by Security National Insurance Company.

Membership Renewal Drive 2003–2004

The Membership Renewal Drive started on September 1st and is now in full swing. You should have received your membership renewal package in the mail. If you have not received it, please contact the CDHA toll-free at 1-800-267-5235 or by e-mail at mmp@cdha.ca. We want to remind you that renewals take 4–6 weeks to be processed **after** they are received in our Processing Centre. Don't delay. Send in your renewal **today** to guarantee uninterrupted access to your membership benefits!

Important Notice

It has been brought to CDHA's attention that CDHA members have been solicited by telephone by an independent insurance representative regarding long-term disability insurance coverage, among other products. This individual **has not** acquired member information from the CDHA, nor does this person represent CDHA's insurance programs. CDHA endorses only the disability insurance plan that is available to members through Sun Life. If you have any questions or concerns regarding this direct solicitation, please contact the Membership and Conference Coordinator at 1-800-267-5235 or by e-mail at mmp@cdha.ca.

Follow-up on Success Story

Margit Juhasz's story about the challenges of setting up her own dental hygiene business was a feature in the 2002 September/ October issue of *Probe* that focused on entrepreneurship. Margit's independent dental hygiene clinic in Mississauga, Ontario, celebrated its second anniversary in June 2003, showing what hard work, dedication, and a passion for one's profession can do!



Press Release - June 19, 2003

Recommendations Adopted by the House of Commons Standing Committee on Health

June 19th, 2003, Ottawa: The Standing Committee on Health report on First Nations and Inuit Dental Health was tabled in the House of Commons. The report recommendations for Health Canada incorporated a number of suggestions which the Canadian Dental Hygienists Association (CDHA) made as an expert witness for the Committee. Some of the Committee's recommendations to improve access to preventive dental hygiene services follow:

- Permit and facilitate a more independent role for dental hygienists allowing them to bill directly up to a predetermined amount of \$200 per client annually.
- Work closely with universities and colleges on scholarships for dental hygienists, particularly those aimed at increasing the number of First Nations and Inuit dental hygienists.
- Undertake a new approach to oral health based on a wellness model that gives priority to promotion and prevention strategies.
- Improve public education and awareness on oral health as a key element of overall well-being.

Susan Ziebarth, CDHA Executive Director, indicates that, "If dental hygienists do the prevention and health promotion work in remote areas, then fewer children will have to be flown out of their communities for dental surgery and to treat oral infections. There will be less pain and suffering and a better quality of life for First Nations and Inuit peoples, and lower costs for Health Canada."

To view the Standing Committee report, please visit: www.parl.gc.ca/InfoCom/CommitteeReport.asp?Language=E&Parliament=98Joint=0&CommitteeID=247

To view the CDHA oral presentation to the Committee please visit: www.cdha.ca/content/newsroom/pdf/aboriginal_peoples.pdf

For additional information please contact:

Judy Lux
(613) 224-5515 ext. 23
1-800-267-5235
e-mail: jal@cdha.ca
www.cdha.ca

Correction

In the March/April 2003 issue of *Probe*, page 64 (right column), the following sentence "The Centers for Disease Control and Prevention...one-month periodontal maintenance" should have read "Crawford has thus suggested that patients who have CD4 counts below 200 be placed on one-month periodontal maintenance." Reference 25 should have read: "Crawford, J.W.: Immunodeficiency virus-associated periodontal diseases. A review. *J Dent Hyg* 67(4): pp. 189-207, 1993."

Oral-B Health Promotion Awards Announcement

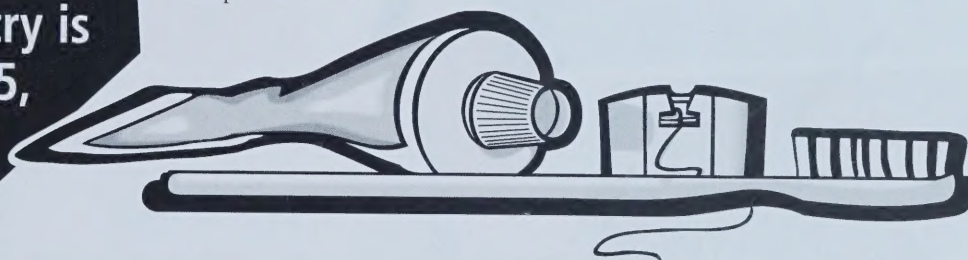


We want to hear how creative you've been in promoting your profession this year. Send us your stories and photos. Entries will be judged on their creativity, planning, volunteer recruitment, educational elements, community impressions and impact as well as innovative partnerships. Entries must be received by December 5, 2003 at CDHA, 96 Centrepointe Drive, Ottawa, Ontario, K2G 6B1.

To help you get your submission ready, please e-mail us at info@cdha.ca, call toll-free 1-800-267-5235, or fax us at 613-224-7283 to request an Oral-B Health Promotion Award kit.

Once again, Oral-B has put together an outstanding *free* kit for CDHA members. Materials include Oral-B products and samples, as well as educational information and high-value coupons for clients.

**Remember
—the deadline
for submission
of your entry is
December 5,
2003.**



Get involved and you could win!

Enter by Friday, December 5, 2003

- Individuals \$1,000;
- clinic teams \$2,000; and
- dental hygiene schools \$2,000

Half of each prize will be shared with the winner's local dental hygiene chapter.

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La Bourse Promotion Santé Oral-B - Annonce

Dites-nous dans quelle mesure, cette année, vous avez exercé votre créativité pour faire la promotion de votre profession. Faites-nous parvenir des anecdotes et des photos. Les envois seront jugés par rapport à leurs résultats au niveau de la créativité, de la planification, du recrutement de bénévoles, des éléments éducatifs, des impressions faites sur la collectivité et de leur impact ainsi que sur la dimension innovatrice des partenariats créés. Les envois doivent parvenir à l'ACHD au plus tard le 5 décembre 2003, 96 promenade Centrepointe, Ottawa, Ontario, K2G 6B1.

**N'oubliez pas—la
date limite pour la
présentation de votre
participation est le
5 décembre 2003.**

Pour qu'on puisse vous aider à préparer votre présentation, faites-nous parvenir un courriel à info@cdha.ca; ou appelez sans frais le 800-267-5235 ou télécopiez au 613-224-7283 recevoir la trousse pour la Bourse promotion santé Oral-B.

Oral-B a assemblé de nouveau une superbe trousse *gratuite* pour les membres de l'ACHD. Elle contient des produits et échantillons Oral-B, ainsi que des renseignements éducatifs et des coupons de grande valeur pour les clients.

Participez et vous pourriez gagner!

5 000 \$ en prix!

Inscrivez-vous au plus tard le vendredi 5 décembre 2003

- individus, 1 000 \$;
- équipes de cliniques, 2 000 \$; et
- écoles d'hygiène dentaire, 2 000 \$

La moitié de chaque prix sera partagée avec le chapitre local de l'association d'hygiène dentaire de la gagnante.

"ELVIS IS ALIVE AND WELL IN REGINA!" (continued from page 202)

tee chairs and their volunteers who helped to make this conference a success. We also said goodbye to our Registrar/Secretary/Treasurer, Charlene Hamill, whose position ended the first of July when the new Executive Director, Barbara Long, took over. We would like to thank Charlene

for her many years of hard work and dedication to SDHA.

On behalf of the SDHA organizing committee, we would like to thank everyone for coming to Regina. We hope to see you all in November for Grey Cup! 🏈

Conference Review



Expanding Horizons

14th Annual Professional Conference
Regina, Saskatchewan
June 20-22, 2003

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Joan McCusker



Left: Sheila Petrollini (l.)
and Irene Buzash (r.),
conference co-chairs



Marilyn Goulding



Parade of Flags (l to r): Susanne Sunell, Catherine Grater-Nakamura,
Barbara Gibb, Karen Wolf, France Bourque, Harriet Rosenbaum

A Special Thank You to CDHA's Sponsors

Crest

Oral-B

PHILIPS
sonicare
the sonic toothbrush

Crest – As a Gold Sponsor, Crest has continued over the past year to support CDHA's efforts to promote good oral health to the Canadian public. As the official sponsor of CDHA's 2003 National Dental Health Month Campaign, Crest again brought us the Dental Hygiene Challenge Quiz. Crest also kept up its support of dental hygienists by producing, in conjunction with CDHA, a brochure on the wise use of fluoride for members to download and distribute to their clients. As well, Crest was again a participant in the CDHA on-line product directory and a supporter of the Crest School Kits, which reached 425,000 children throughout the country. Crest once more contributed to the CDHA Annual Professional Conference through active participation as an exhibitor and conference sponsor. We wish to offer a special thank you to this much-valued partner for their continued support.

Oral-B – Oral-B has a long-term relationship with the CDHA as a Silver Sponsor. They continued their support of dental hygiene education through student scholarships and encouraged dental hygienists to promote good oral health through community health awards. They also donated 16,000 toothbrushes to CDHA for distribution through our membership to special needs programs. Oral-B once again participated in the on-line product directory and in the CDHA Annual Professional conference as an exhibitor and by their provision of delegate bags and sponsorship of three speakers. Thank you to Oral-B for their continued efforts.

Sonicare – As a new partner to CDHA, Sonicare sponsored two speakers at the CDHA Annual Professional Conference and participated as an exhibitor. They have also provided support to CDHA members through the on-line product directory. CDHA thanks Sonicare for its support and looks forward to a long relationship with this new sponsor.



Top right: Karen Wolf (l.) presenting Cindy Sensabough of Crest with a gift in appreciation of their sponsorship
Middle right: Karen Wolf presenting Darren Morrison of Oral-B with a gift in appreciation of their sponsorship
Bottom right: Sonicare booth



Laura MacDonald

Dinner theatre: (l to r)
Susanne Sunell, Marg Wilson, Terry Michell, Diane Matheson, Salme Lavigne





Expanding Horizons

Conference Tapes

CDHA 14th Annual Professional Conference
Regina, Saskatchewan – June 20-22, 2003



Organizers have made arrangements for audio recording of all major sessions. If you missed something or want to share some important topics with colleagues, use this as an order form. 60 or 90 minute cassettes at \$10.00 each.

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Full Set (9 tapes, with library case) **\$95. Individual Tapes: \$10** each. Please check off sessions and indicate quantity wanted.

- ☐ QUANTITY 2. Concepts Plus: Musculo-skeletal Health and Dental Hygiene: **Susanne Sunnell**, BA, DipDH, MA, EdD
- ☐ QUANTITY 3. Dental Hygiene in Canada: Patterns, Trends and Changes: **Patricia M. Johnson**, PhD, RDH
- ☐ QUANTITY 4. The Fifth Element —Workshop on Dental Hygiene: **Laura MacDonald**, DipDH, BScD, MEd
- ☐ QUANTITY 5. Taking the Bite out of Nutrition for Dental Health: **Helen Bishop MacDonald**, RD, MSc, FDC
- ☐ QUANTITY 6. Donde le Duele - Where Does it Hurt?: **Dr. Amil Shapka**, BSc, MD, CCFP, DDS
- ☐ QUANTITY 7. Periodontal Medicine: **Salme Lavigne**, RDH, BA MS(DH)
- ☐ QUANTITY 8. Instrument Options for Non-surgical Periodontal Therapy: How to Decide What's Right for Your Practice! **Barbara A. Long**, SDT, RDH, CACE
- ☐ QUANTITY 9. **Community Connections**: Mouth Guard Program: **Dean Lefebvre** / Mobile Dental Hygiene Services: **Gerrard Weinberger**
- ☐ QUANTITY 10. Biofilm: And You Thought It Was Just Plaque!: **Marilyn Goulding**, RDH, BSc, MOS

Tape Coverage Still Available from CDHA 13th Annual Professional Conference in Moncton

- ☐ QUANTITY 1. *Cardiovascular Health & Oral Hygiene – **Dr. Michel D'Astous**, MD FRCP
- ☐ QUANTITY 2. Alternate Practice Settings for Dental Hygienists – **Dr. Pran Manga**, PhD M.Phil
- ☐ QUANTITY 3. Nutritional Influences on Dental Hygiene – **Peter Ford**
- ☐ QUANTITY 5. CDHA Code of Ethics Workshop: Application to Day-to-Day Work – **Nancy Neish**, DipDH BA MEd & **Laura MacDonald**, DipDH BScD, MEd (Facilitators)
- ☐ QUANTITY 6. *Paradigm Shift in Early Caries Treatment: Emerging Concepts for the 21st Century – **Jan Pimlott**, DipDH, BScD, MSc
- ☐ QUANTITY 7. Consumer Oral Health Care Products: Product Trends, the Evidence and Future Directions – **Jan Pimlott**, DipDH, BScD, MSc
- ☐ QUANTITY 8a. Floss or Die – **Marilyn Goulding**, RDH, BSc, MOS
- ☐ QUANTITY 8b. (2 tapes, 2nd tape partial: \$15.00)
- ☐ QUANTITY 10. *Relationships between Oral Health and the Aging Individual – **Terry Mitchell**, BSc RDH MEd
- ☒ QUANTITY *X Overflow from #1 (2:00), #6 (:08), and #10 (:09)

Name: _____

Address: _____

No. of tapes: _____ Cost of tapes: \$ _____ Handling: \$ _____ GST: \$ _____ PST (Ont. Res.): \$ _____ Total: \$ _____

☐ Cheque ☐ Visa ☐ Mastercard Card # _____ Exp. Date: _____

Signature for credit card order _____



To order by mail add \$1.30 per tape for handling plus 7% G.S.T. Ontario residents also add 8% P.S.T. Send this form along with payment (cheque payable to Conference Tape) to: 8 Woodburn Drive, Ottawa, Ontario K1B 3A7 Tel.: (613) 824-2583, Fax: (613) 824-2584, E-mail: contape@cyberus.ca



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Above: Town Hall group discussion
Left: Registration (l to r): Shannon Greenbank, Teri Ostlund, Lana Dahl
Below: Karen Wolf (centre) presenting certificates of appreciation to Irene Buzash (l.) and Sheila Petrollini (r.)



Thank You to Conference Volunteers

*Volunteers don't necessarily have the time;
they just have the heart.*
— Anonymous

Organizing an annual conference requires a great commitment of time but also much passion and heart. The volunteer organizing committee for CDHA's conference in Regina (June 2003) may have been short on time, but they made up for this twofold with heart. While a committee usually has over a year to plan such an extensive event, this year's committee had only nine months. A tireless group led by Irene Buzash and Sheila Petrollini met on a regular basis to ensure every last detail was looked after, from the strong scientific program to the entertainment. With the help of on-site volunteers, they provided conference participants with the opportunity to expand their horizons, both professionally and personally.

On behalf of the CDHA staff and all of the participants of the 14th Annual Professional Conference, we thank the organizing committee and all the dedicated on-site volunteers for their hard work. The dedication and heart will not soon be forgotten.

Conference Organizing Committee

Irene Buzash	Conference Co-Chair
Sheila Petrollini	Conference Co-Chair
Nancy Bateson	Scientific Chair
Mildred Contreras	Fundraising Co-Chair
Bonny Marshall	Fundraising Co-Chair
Diane Moore	Volunteer Co-Chair
Mary-Ellen Murray	Volunteer Co-Chair
Sheila Jozsa	Hospitality Co-Chair
Laurie Taylor	Hospitality Co-Chair



Patricia Johnson



Nicole Bush and
Anthony Holtkamp



(L to r) Rhonda Duncan,
Christie Young, Joan
McCusker, Cilla Watkins

Thank you to Sponsors of CDHA's 14th Annual Professional Conference

CDHA recognizes the following organizations for their sponsorship of speakers or events at CDHA's 14th Annual Professional Conference: the Dairy Farmers of Saskatchewan; Patterson Dental; Saskatchewan Dental Hygienists' Association; Straumann Canada Ltd. Their participation made the 2003 Annual Professional Conference an even greater success.

Thank you to Commercial Exhibitors at CDHA's 14th Annual Professional Conference

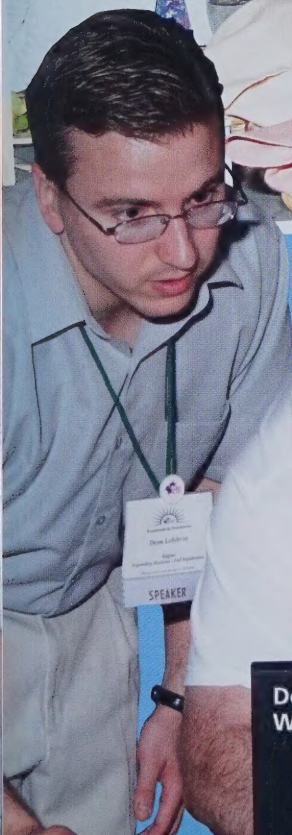
The participation of the following commercial exhibitors at the Annual Professional Conference in June supplemented the other educational components of the conference. The representatives from these companies shared new trends and products, providing the delegates with the opportunity to expand their horizons. We wish to thank all of the for their time and effort: American Eagle Instruments; Ash Temple Ltd.; Bolton/Buffalo Dental MFG.; Canadian Sugar Institute; Crest; Dairy Farmers of Canada; Dentsply Canada Ltd.; GlaxoSmithKline Consumer Healthcare; Hu-Friedy Mfg.; John O. Butler Company; Oral-B; Perfect Solutions Inc./ WMS Dental; Pfizer Consumer Healthcare; Premier Dental (Canada); SciCan; Septodont of Canada Inc./Novocol; Sonicare.

Distinguished Service Award to Salme Lavigne

In late June 2003 at the annual CDHA conference, Karen Wolf, President of CDHA, presented the Distinguished Service Award to Salme Lavigne for her significant contribution to the advancement of the dental hygiene profession and of CDHA at the national level. Salme has served as a member of the CDHA Board of Directors and as CDHA President in 2000–2001. She has also been a CDHA representative on the Commission on Dental Accreditation of Canada (CDAC), member of the reviewer group for Probe, chair of the Baccalaureate as Entry to Practice Task Force, and first chair of the Board of the CDHA Foundation for Dental Hygiene Education and Research. She is a researcher and a presenter provincially, nationally, and internationally, and for the past several years, has been an educator and director of the dental hygiene programs at the University of Manitoba, Confederation College and Wichita State University. She has also held a director's position with the American Dental Hygienists' Association. As Karen Wolf remarked, "Salme, you are a passionate champion of the profession, a mentor for many dental hygiene students, and an inspiration for us all. Heartfelt congratulations."



Left: (L to r) Fran Richardson,
Brenda Walker, Fern Hubbard
Below: Helen MacDonald



Dean Lefebvre (l.) and Gerrard
Weinberger (r.)



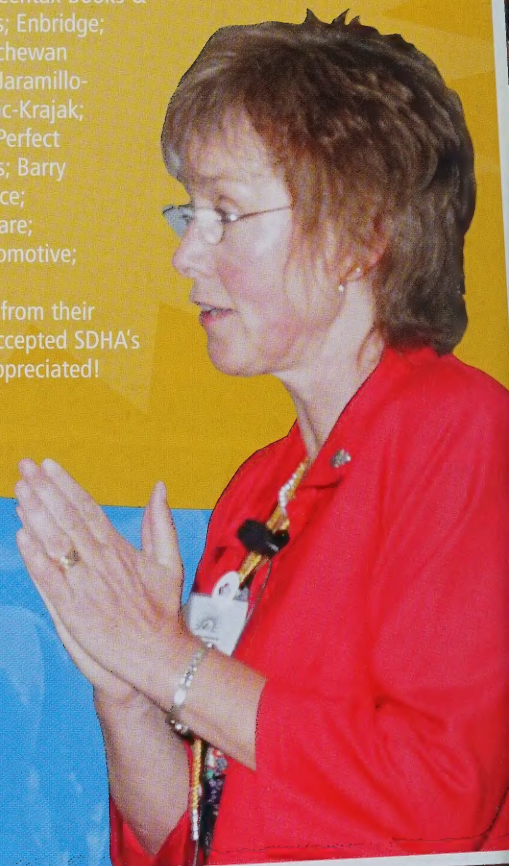
Thank you to Door Prize Donors at CDHA's 14th Annual Professional Conference

CDHA thanks the following companies and individuals for generously donating door prizes for CDHA's 14th Annual Professional Conference: Mr. and Mrs. Terry Abadiano; Alison Galbraith & Co.; American Eagle Instruments; Anderson & Co. Law Office; Ash Temple Ltd.; Avon; Bank of Montreal – Mark Perkins; Bank of Nova Scotia – Regina; Berting Glass; Blue Cross; Brownies & Beyond; Dr. Isaac Caburao; Cameco Corporation; Casino Regina; Centax Books & Distribution; Conexus Credit Union; Craft Shack; Luis De Paz; Dorothy Pearl Uniforms; Enbridge; Michelle Frank-Bennett; Grosvenor Park Dental; Grower Direct Florists; Hotel Saskatchewan Radisson Plaza; Hu-Friedy Mfg.; Ideal Dental Lab; John O. Butler Company; Hermon Jaramillo-MacKenzie; Lorinda Karakochuk; KCS Marketing; Yvonne Kidd; Pam Lefebvre; Dr. Lulic-Krajak; Mary Kay Cosmetics; Natural Plantation Inc.; Martha Needham; Page Credit Union; Perfect Solutions Inc./WMS Dental; Premier Dental; Regina Inn Hotel; ReMax – Norm Dennis; Barry Robbins; Roots; Safeway; Saskatchewan Energy; Saskatchewan Government Insurance; Septodont of Canada Inc./Novocol; Sherwood Co-op; Silhouette Beauty Salon; Sonicare; Dr. Roger Spink; Tourism Regina; Trade Winds Travel; T-Rex Jacket; Vogt Brothers Automotive; Judy Welch; West Harvest Inn; Westridge Construction Ltd.

Their generous contributions permitted the delegates to bring home a memento from their time in Regina. And to all of the dental hygienists throughout Saskatchewan who accepted SDHA's challenge to provide a door prize for the conference, your donations were greatly appreciated!

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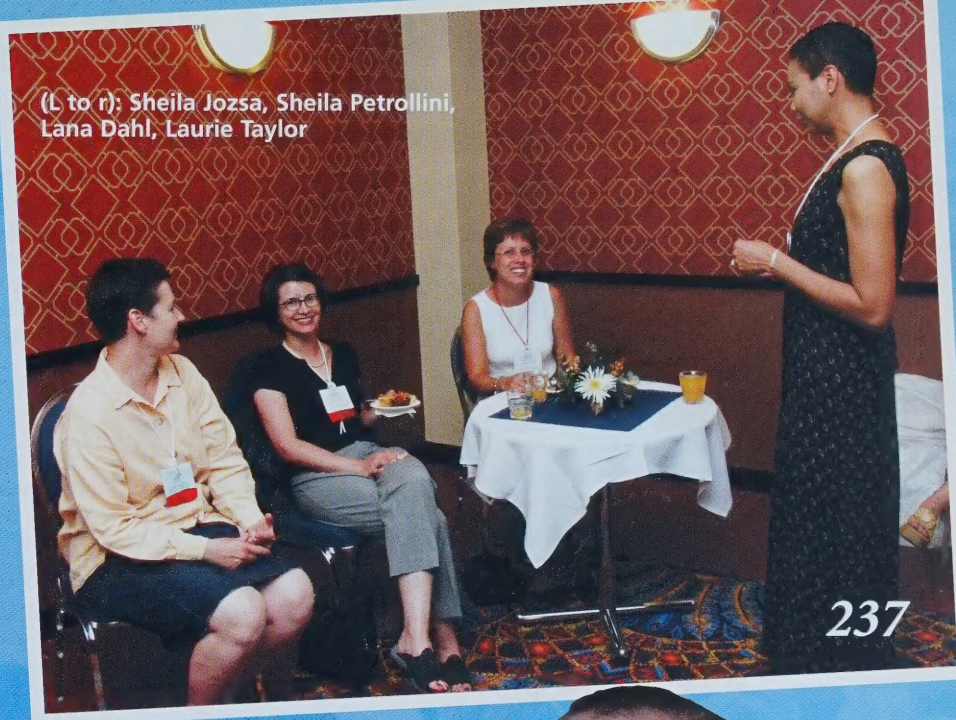
Top right: Susanne Sunell
Bottom left: Salme Lavigne
Bottom right: Dinner theatre:
Cindy Fletcher (l.) and Ginny Cathcart



REGINA INN
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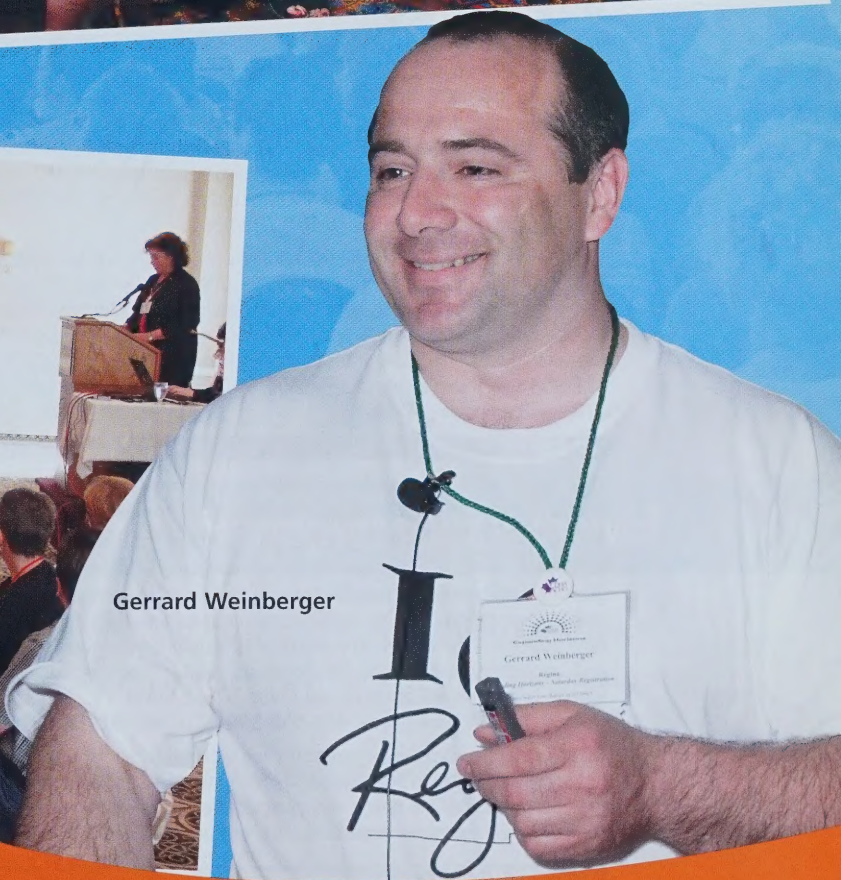
Above: CDHA booth
Below: Town Hall meeting



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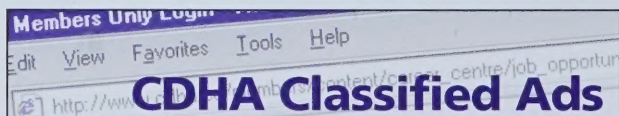
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OTHER

UBC BDS PROJECT Pauline Imai, a fourth-year student in the BDS program at the University of British Columbia, is developing a "profile" of program graduates for the past 10 years. For the pilot study, however, she also needs dental hygienists who have a baccalaureate degree in dental hygiene from a university other than UBC. If you can help in this project, please contact Pauline via e-mail, paulineimai@hotmail.com; telephone, **604-263-2608**; or fax, **604-266-5111**.

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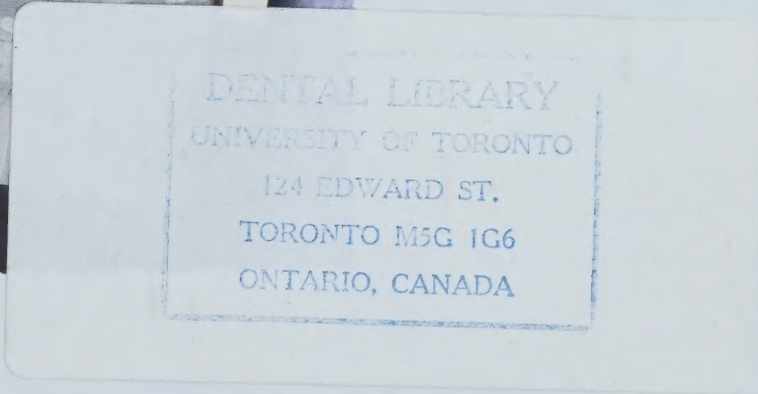
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SCIENTIFIC ISSUE

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USING EDUCATIONAL RESEARCH TO SUPPORT CHANGE

ACCESS ANGST: CDHA POSITION STATEMENTS ON ACCESS TO ORAL HEALTH SERVICES



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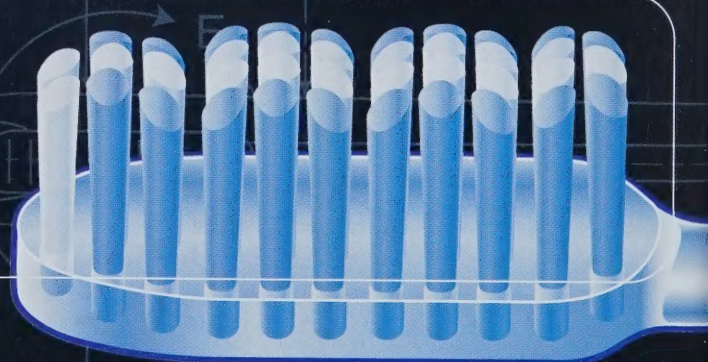
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* Reynolds, H.S. and Zambon, J.J. Microbiological and Clinical Alterations From Using Butler "GUM" Toothbrushes. J Dent Res 76, Abstract #1753, 1997.



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Our Challenges

by Patty Wickstrom

"Every Canadian is entitled to access comprehensive oral health care";¹ "there are no financial or other barriers to the public's access to the services of dental hygiene."² These statements sum up one of the major goals of the Canadian Dental Hygienists Association: ensuring that all the Canadian population has access to oral health care.

As I begin my term as President of CDHA, access to oral health care has become increasingly important. "Access Angst," an article in this issue of *Probe*, goes into detail about the many population groups in Canada—a wealthy, developed country with socialized medicine—who are unable to get even basic oral health care. The link between income and social standing and one's general health certainly holds true for oral health as well: a large proportion of those who cannot get oral health care are the marginalized, the elderly, and the sick.

*We are willing, competent,
and able to bring preventive
and therapeutic oral health
care to the underserved.*

This is where we, as dental hygienists, can make a difference. We are willing, competent, and able to bring preventive and therapeutic oral health care to the underserved. We want to be able to go into long-term residences, homes, and community health centres to assist those in need with minimal or no restrictions. However, we are meeting many barriers, the main one being legislative, and this occurs in most regions of the country. With the aging of the population and increasing need for oral health care, the situation is not going to improve without positive action by government. In the meantime, it is up to us as individuals to promote ourselves to the public as well as local government officials and to search out ways in which we can access and provide oral health care to the underserved within the current confines. One of my priorities

"Our Challenges" ... continued on page 249

1. Canadian Dental Hygienists Association: The management of dental hygiene care – guiding principles. CDHA position statement. Ottawa: CDHA, 1992

2. Canadian Dental Hygienists Association: Ends statements. [Cited October 6, 2003.] < www.cdha.ca/members/content/inside_cdha/cdha_priorities_ends.asp#2 >

Nos défis

par Patty Wickstrom



"Tous les Canadiens ont le droit d'avoir accès à des soins complets de santé buccale";¹ "il n'y a pas d'obstacles, financiers ou autres, qui interdisent au public l'accès aux services d'hygiène dentaire."² Ces énoncés résument un des principaux buts de l'Association canadienne des hygiénistes dentaires : faire en sorte que toute la population canadienne ait accès aux soins de santé buccale.

Au moment où j'entame mon terme comme présidente de l'ACHD, l'accès aux soins de santé buccale n'a cessé de prendre de l'importance. Un des articles de ce numéro de

Probe, intitulé "Access Angst", examine en détail les nombreux groupes de la population du Canada, pays riche et développé à la médecine socialisée, qui sont dans l'impossibilité d'obtenir même les soins de santé buccale de base. Le lien qu'on a établi entre le revenu, le statut social et l'état de santé général d'une personne reste certainement vrai aussi pour la santé buccale : la grande proportion de ceux qui ne peuvent pas obtenir les soins de santé buccale sont les marginaux, les aînés et les malades.

C'est ici que nous, en tant qu'hygiénistes dentaires, pouvons faire une différence. Nous voulons apporter des soins de santé buccale préventifs et thérapeutiques à ceux qui sont sous-desservis, et nous en avons la compétence et la capacité. Nous voulons pouvoir aller, avec peu ou pas de restrictions, dans les résidences de longue durée, les foyers et les centres de santé communautaire pour aider ceux qui sont dans le besoin. Mais nous faisons face à plusieurs obstacles, le principal étant d'ordre législatif, situation qui se produit dans la plupart des régions du pays. Avec le vieillissement de la population et le besoin croissant de soins de santé buccale, la situation ne va pas aller en s'améliorant sans qu'il n'y ait des gestes positifs de la part du gouvernement. Entre temps, c'est à nous qu'il revient, à titre individuel, de faire notre propre promotion auprès du public et des représentants locaux des gouvernements, et de chercher comment nous pouvons avoir accès aux personnes sous-desservies et leur dispenser des soins de santé buccale à l'intérieur des limites actuelles. L'une de mes priorités cette année sera de faire avancer davantage le dossier où nous cherchons à obtenir le pouvoir de desservir les gens là où ils vivent, dans des milieux non traditionnels ainsi que dans des milieux traditionnels sans limites imposées.

Il nous reste aussi d'autres défis à relever, la préparation scolaire des hygiénistes dentaires, le remboursement par des tierces parties du coût des services des hygiénistes dentaires, l'expansion de la recherche basée sur la preuve dans le domaine de l'hygiène dentaire, le module de détartrage proposé pour les assistantes dentaires, l'expansion de l'auto-réglementation à l'ensemble de pays.

"Nos défis" ... suite à la page 249



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**Authors' guidelines for submitting manuscripts
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(www.cdha.ca/content/resources/publications_probe.asp).**

Please see our advertisement on page 246



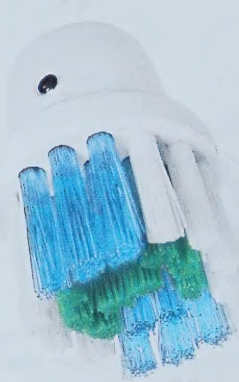
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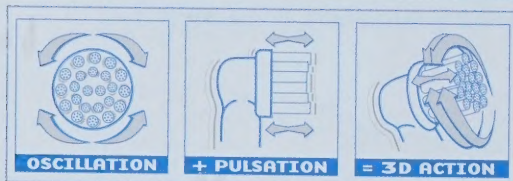
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¹ Heanue et al. Manual versus powered toothbrushing for oral health (Cochrane Review). In: The Cochrane Library, Issue 1, 2003, Oxford: Update Software. Full report online at www.update-software.com/toothbrush. BRAA32111 © 2003 Oral-B Laboratories

Importance

by Susan Ziebarth, CHE

"Things are only as important / As I want them to be"

From the song "I'm Free" on the album Jon Secada
©1992, SBK Records

One of the articles in this issue is "Access Angst." Angst is defined as a state of anxiety or continuous worry, but why would CDHA be concerned or worried about access? A look at our mission brings the answer. It is as important as we want it to be.

Our mission reads: "The Canadian Dental Hygienists Association is the collective voice and vision of dental hygienists in Canada advancing the profession, supporting its members and contributing to the oral health and general well-being of the public."

We worry about the public's access to the oral health prevention and promotion knowledge and skills of our members. CDHA's Board of Directors speaks out strongly on behalf of the public: its health is an important component of both the association's and our members' reason for being. As evidenced by our mission statement, we believe that access to dental hygienists will enhance the well-being of Canadians.

*"We believe that access to
dental hygienists will enhance
the well-being of Canadians."*

Translating this concern into action has taken CDHA down a few pathways. The first is ensuring access to evidence-based oral health information for the public: Why is oral health important? What can the public do to improve its oral health and thereby general health outcomes? The second path is helping the public understand what dental hygienists are and what they do, and how they can help individuals improve their oral health. Finally, the third path is removing barriers to obtaining the services of dental hygienists. Are there financial and legal barriers that can be lifted? Are there specific vulnerable populations who are in acute need where we can make an impact?

In today's fast-paced life, when people are inundated with information and want instant results, it is difficult to get people's attention and have them understand that oral health is important. CDHA has taken action at the national level but

"Importance" ... continued on page 249

L'importance

par Susan Ziebarth, CHE

*"Les choses n'ont que l'importance /
Qu'on veut bien leur donner" (trad.)*

Extrait de la chanson "I'm Free" de l'album de Jon Secada
©1992, SBK Records



Un des articles de ce numéro s'intitule "Access Angst". Le mot Angst se définit comme un état d'anxiété ou de soucis continus ; mais pourquoi l'ACHD se préoccuperait-elle d'accès ou se ferait-elle du souci à cet égard ? Un coup d'oeil à notre mission nous donne la réponse à cette question. C'est aussi important qu'on veut bien que ce le soit.

Dans notre mission on lit que : "L'Association canadienne des hygiénistes dentaires est l'organisme qui agit comme porte-parole des hygiénistes dentaires du Canada et qui propose une vision propre à faire avancer la

profession, à soutenir ses membres et à contribuer à la santé buccale et au bien-être général du public."

Nous nous préoccupons de l'accès du public aux connaissances et aux compétences de nos membres en matière de prévention des maladies et de promotion de la santé buccale. Le conseil d'administration de l'ACHD parle d'une voix forte au nom du public : sa santé est une composante importante de la raison d'être de l'association elle-même et de nos membres. Comme notre énoncé de mission le fait ressortir, nous croyons que l'accès des Canadiennes et des Canadiens aux services des hygiénistes dentaires améliorera leur bien-être.

La traduction de cette préoccupation en actes a mené l'ACHD par quelques détours. Le premier, c'est d'assurer, pour le public, un accès à une information fondée sur la preuve dans le domaine de la santé buccale. Pourquoi la santé buccale est-elle importante ? Que peut faire le public pour améliorer sa santé buccale et la santé générale qui en est le résultat ? La second détour consiste à aider le public à comprendre qui sont les hygiénistes dentaires et ce qu'ils ou elles font, et comment elles peuvent aider les individus à améliorer leur santé buccale. Enfin, le troisième détour, c'est la suppression des barrières qui font obstacle à l'obtention des services des hygiénistes dentaires. Y a-t-il des barrières financières et juridiques qui peuvent être renversées ? Y a-t-il des populations spécifiques vulnérables qui ont un besoin aigu de nos services, et au sein desquelles nous pouvons faire un impact ?

Dans la vie trépidante d'aujourd'hui, lorsque les gens sont submergés d'information et veulent des résultats immédiats, il est difficile d'attirer l'attention des gens et de leur faire comprendre que la santé buccale, c'est important. L'ACHD a pris les mesures qu'il fallait au niveau national, mais notre

"L'importance" ... suite à la page 249



MILK FAT REDUCES ASTHMA SYMPTOMS IN YOUNG CHILDREN

Various cross-sectional studies conducted in Germany, Greece, Finland and Australia have shown that drinking milk^{2,3} or consuming butter^{4,5} during early childhood is associated with a lower prevalence of atopic disease. But now, a more reliable prospective birth cohort study has demonstrated similar findings.¹

Wijga and colleagues collected food consumption data from 2,978 children aged two years and related it to the prevalence of asthma symptoms reported at the age of three years. Intakes were assessed using a short, simple food frequency questionnaire of 13 items (whole milk, semi-skim milk, milk products, white bread, brown bread, butter, margarine, cheese, fruit, fruit juice, vegetables, meat and fish) sent to parents during the last trimester of pregnancy, three months following birth, and when the children were one, two and three years old.



Consuming whole-milk products during early childhood is associated with a reduced prevalence of asthma.¹

The data showed that daily consumption of whole milk, milk products (e.g., yogurt, chocolate milk, etc.), butter and brown bread were significantly associated with lower rates of asthma and/or wheezing.¹ Children who did not consume milk were 63% more likely to have had a doctor's diagnosis of asthma than those who consumed whole milk daily. The prevalence of recent asthma (defined as ever having been diagnosed with asthma and having experienced asthma symptoms and/or taken asthma medication during the last 12 months) was substantially lower in children who consumed butter daily (1.5%) than in those who avoided butter (5.1%). The adjusted odds ratios for recent asthma were: whole milk daily vs rarely = 0.59, butter daily vs rarely = 0.28. Recent wheezing (defined as having experienced one or more wheezing episodes during the last year) was also lower in children who consumed milk products (13.7%) or butter daily (7.7%) than in those who did not (18.4% and 15.4%, respectively). There were no statistically significant associations observed between asthma symptoms and the consumption of fruits, vegetables, margarine or fish.¹

Studies like this one should help put an end to the myth that those with asthma should avoid milk. And that's particularly good news when you consider the important role milk plays in the development of strong teeth and bones.

**Products containing milk fat
have a risk-reducing effect
on the development
of asthma and wheezing
in preschoolers.¹**

References: 1. Wijga AH et al. 2003. Association of consumption of products containing milk fat with reduced asthma risk in pre-school children: the PIAMA birth cohort study. *Thorax* 58:567-572. 2. Von Ehrenstein OS et al. 2000. Reduced hay fever and asthma among children of farmers. *Clin Exp Allergy* 30:187-193. 3. Barnes M et al. 2001. Crete: does farming explain rural and urban differences in atopy? *Clin Exp Allergy* 31:1822-1828. 4. Dunder T et al. 2001. Diet, serum fatty acids and atopic disease in childhood. *Allergy* 56:425-428. 5. Haby MM et al. 2001. Asthma in preschool children: prevalence and risk factors. *Thorax* 56:589-595.



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"Our Challenges" (continued from page 243)

this year will be to take forward the dental hygienists' quest to be able to serve people where they live, in non-traditional settings as well as traditional without limitations.

Other challenges also remain for us to work on—educational preparation for dental hygienists, third-party reimbursement of dental hygienists, expanding evidence-based research in the dental hygiene field, the proposed scaling module for dental assistants, extending self-regulation across the entire country.

Together, the national and provincial dental hygienists' associations will strive to move forward on all fronts.

"Nos défis" (suite de la page 243)

Ensemble, les associations provinciales et nationale d'hygiénistes dentaires, nous nous efforcerons d'avancer sur tous les fronts.

Je suis honorée de succéder à notre présidente sortante, Karen Wolf, qui a servi cette année passée avec dévouement et avec beaucoup de travail. J'ai la bonne fortune de la voir demeurer au conseil en tant que présidente sortante et de

I am honoured to be succeeding our outgoing President, Karen Wolf, who has served this past year with dedication and much hard work. I am fortunate she will remain on the Board as Past President so I can tap into the wealth of knowledge she possesses. On behalf of CDHA and the Board of Directors, I would like to thank Karen for her commitment to the profession of dental hygiene in Canada.

Onward and upward...

Patty Wickstrom can be reached at <president@cdha.ca>. 

"Importance" (continued from page 247)

our association also exists to support you in serving Canadians. We have just celebrated National Dental Hygienists Week and have heard of the many exciting initiatives undertaken by our members. We will be sharing some of these with you in our next issue.

We will also asking you to share your opinions with us. In the coming weeks, you will receive a card in the mail inviting you to participate in our second national labour survey. The majority of our members reviewed the results of the survey last year and the feedback we received was very helpful in revising the survey tool. We want to know what things are

important to you. As you know, the higher the response rates, the better the quality of our data. Please participate.

Enjoy the holiday season and remember—when the season's pressures are weighing on your shoulders—that "this is only as important as [you] want it to be." 

Clarification: The comments by Dr. Anthony Kravitz, President-Elect of the British Dental Association, that were contained in the Executive Director's Message in the 2003 July/August issue of *Probe* were personal opinions and do not reflect the official stance of the British Dental Association.

"L'importance" (suite de la page 247)

association existe également pour vous soutenir dans le service que vous rendez aux Canadiens. Nous venons tout juste de célébrer la Semaine nationale des hygiénistes dentaires et nous avons entendu parler des nombreuses initiatives palpitantes entreprises par nos membres. Nous partagerons quelques-unes de celles-ci avec vous dans notre prochain numéro.

Nous allons aussi vous demander de nous communiquer vos opinions. Au cours des prochaines semaines, vous allez recevoir par le courrier une carte vous invitant à participer à notre second sondage national sur l'emploi. La majorité de nos membres ont examiné les résultats de l'enquête de l'année passée et les réactions que nous avons reçues nous ont beaucoup aidées à réviser l'outil de sondage. Nous voulons savoir quelles sont les choses qui sont importantes pour vous. Comme vous le savez, plus les taux de réponses sont élevés, meilleure est la qualité de nos données. Nous vous prions donc de participer au sondage.

Profitez bien de ce temps de fête et rappelez-vous, lorsque les pressions de la saison vous pèsent lourd, que "les choses n'ont que l'importance qu'on veut bien leur donner". 

Clarification : Les commentaires émis par Dr Anthony Kravitz, président désigné de la British Dental Association ? inclus dans le message de la directrice générale du numéro de *Probe*, juillet/août 2003 ? représentaient des opinions personnelles et, par conséquent, ne reflètent pas la position officielle de la British Dental Association.

Take care of yourself ...

You work hard—taking care of your clients, and your family. CDHA works hard to provide many of the things you need to take care of yourself. This includes an insurance program, with disability coverage, provided through Sun Life Assurance Company of Canada (Sun Life).

Take care of yourself. Go online to www.cdha.ca/members, or call Sun Life at 1-866-253-6060, between November 17, 2003 and May 3, 2004, to get more coverage information and to enter a draw for a \$2,000 weekend relaxation getaway.

Visit the CDHA web site for official contest rules. No purchase is necessary. Some restrictions apply.

ERGONOMICS

September 26, 2003

Dr. Lance Rucker
Faculty of Dentistry
University of British Columbia

Dr. Susanne Sunell
Vancouver Community College

[Letter received by e-mail]

Dear Patricia,

First, congratulations to the "Probe" on hosting an issue of a dental hygiene periodical devoted entirely to clinical ergonomics. We were proud to have been selected as contributors.

In Peggy McCann's article, "Bad Backs and Repetitive Strain," she carefully and accurately outlines and illustrates many critical postural profile elements, and puts these in appropriate perspective relative to the known psychosocial and personal factors which are related to musculoskeletal health.

At the end of her discussion, however, Ms. McCann comments that, "Some experienced hygienists have discovered 'tricks' to take the load off the shoulders by temporarily resting their elbow or forearm on the thigh. That is the same idea as Öberg's chair design." She illustrates one such "trick" maneuver in Figure 7. We take issue with both statements.

In our experience working with dental hygienists during Ergonomic Practice Assessments, the sorts of postures and positioning described (and shown) in the article as attempts to "fix" the fatigue and discomfort problems in such ways invariably result in a destructive replacement of one set of symptoms with another. We liken this strategy to what happens when one finds an error in one's checkbook balance and attempts to rectify it by inserting a matching error.

The dental hygienist in the illustration, rather than respecting the postural guidelines and balanced profiles so ably described by Ms. McCann earlier in her article, demonstrates tilting and twisting of her torso, as well as abduction of both elbows. In order to preserve the access to the oral cavity which the hygienist has tried to achieve in this photo, she could have adjusted the equipment (e.g., raising the patient chair base slightly and increasing the articulating headrest angle slightly) and the patient (e.g., patient head rotation to the right and tipped slightly further in extension). This would allow the same access in a harmonious, low-risk balanced posture. The problem with the "trick" position demonstrated is that it sets up a static off-balance loading, inviting bursitis of the shoulder in the long term. It is an ill-conceived attempt to reduce the fatigue associated with an initial imbalanced positioning. Such accommodations usually result from presumptions on the part of the dental hygienist that "balance cannot be achieved anyway, so we might as well take the lesser of evils." Not an approach to recommend. And not an approach which is necessary!

At best, the Öberg chair design attempts to broaden the hand-rest base for dental hygienists who find themselves in postural balance, but positioned such that none of the usual appropriate natural hand rests (e.g., patient zygomatic arch, forehead, or chin) are available. There is no evidence that the design was ever conceived to support out-of-balance stress on the spine or upper extremities, such as that which is demonstrated in Figure 7. Some designs of operator chairs are equipped with elbow rests or forearm rests in order to address

the same concerns. The problems with these designs to date is that they have no built-in mechanical stress-breakers. As a result, they invite static leaning of the torso onto the forearms, thus increasing the risk for shoulder bursitis. In addition, these devices tend to interfere with free rotation of the seat when moving to or from chairside, and increase risks of operator and patient injury, entanglement with equipment hoses, etc. Ultimately, most care can be accomplished in excellent postural balance using the natural fulcrum rests for the hands to offset the weight of the clinicians' forearms.

Fifteen years ago we had neither the technology nor the know-how to imagine being perfectly in balance and perfectly comfortable in clinical practice. Now we know better. Fortunately educational programs are beginning to reflect this and dental hygienists in the field are beginning to seek and find better information to help them understand how to make their equipment work for them, rather than spending their days working for their equipment.

Sincerely,

Dr. Lance Rucker
Associate Professor
Director, Clinical Simulation
and the Surgical Telescope
Evaluation Program
Chairman, Division of Operative
Dentistry
Faculty of Dentistry
University of British Columbia

Dr. Susanne Sunell
Dental hygiene educator
Vancouver Community
College

September 30, 2003

Author's response to Drs. Lance Rucker and Susanne Sunell:

I thank Dr. Rucker and Dr. Sunell for their comments. My goal for the July/August Probe was to supply user-friendly information on bad backs and repetitive strain that clinicians could use in their work as well as in their personal life. The principles of bio-mechanics remain the same no matter what activity an individual is performing. I hope that clinicians will apply these principles as best they can, in their work and lifestyle activities.



This picture was taken at the same time as Figure 7 in my article and demonstrates clearly the points in my letter.

the body. Incorporating small position changes into one's routine is wise.

As mentioned in the article, when one bends forward or away from the neutral position without adequately supporting the weight of their upper body, major strain is placed on all areas of the back, neck, and shoulders. The potential for back and other repetitive strain is significant and is likely a major reason that most clinicians who adapt this as a common work habit experience discomfort at work. Another factor to consider is the considerable amount of static loading that one position, even a correct one, places on

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1. Platt K, Moritis K, Johnson MR, Berg J, Dunn JR. Philips Oral Healthcare. *Am J Dent* 2002;15(Special Issue):18B-22B. (versus Sonicare Advance)

2. Hope CK, Wilson M. University College London, Eastman Dental Institute. *Am J Dent* 2002;15(Special Issue):7B-11B. (in vitro study versus Braun Oral-B 3D)

3. Sorensen JA, Nguyen H. Oregon Health and Science University. *Am J Dent* 2002;15(Special Issue):26B-32B. (in vitro study versus Braun Oral-B 3D Excel)

4. 2002 U.S. Survey data

I observed this student over several hours and the position shown in the picture is not one he uses as a typical work procedure. He shifted to accommodate a quick look into the oral cavity and also to relax his own back from a static position. He also mentioned to me that many older clients cannot tilt or tip their heads back as far as one would like, and he will try to accommodate for their very real needs.

The picture in the article shows the clinician sitting and working in a relaxed, fairly compact position, bending at the hips and not the waist. His elbows are at right angles and positioned close to his body, his back is straight with his natural curves intact, and he maintains his bracing by leaning his elbow on his leg, allowing the thigh to take his weight. As well, his left leg is forward to further share the support for this position.

I was also impressed with the "ease up" direction of his head...there was no compression on his neck, shoulders and arms. The picture demonstrates a "quick trick" used to compensate for a position that is not textbook perfect, but a natural and understandable adjustment for the moment.

Drs. Rucker and Sunell make a strong point in that we need to teach people how to choose good alternatives that will prevent back strain. Enormous research into ergonomics and the use of scopes has been done and I appreciate their comments and the opportunity to clarify this picture.

Sincerely,

Peggy McCann
Back in Action Health Education Services Ltd.
Victoria, B.C.

VITAL TOOTH WHITENING

Ms. Shirley A. Hok
6333 - 93 St.
Grande Prairie, AB T8W 1A1

[Memo received by fax on July 7/03 - addressed to Marilyn Goulding]

Hi Marilyn:

I have read your research article about vital tooth bleaching in the latest Probe journal. It appears that the bleaching strips are a very convenient and effective method for lightening and brightening our smiles. This sounds wonderful.

However, a patient of mine posed what I feel to be a very valid question about the thoroughness, therefore effectiveness, of the surface coverage of these bleaching strips.

The surfaces of our teeth, in particular the lateral facial surfaces, tend to be curved in shape. And the bleaching strips seem to cover the tooth-to-tooth surfaces in a straight line. Therefore, I am wondering about the actual amount of bleaching product truly reaching and treating these curved surfaces between the interproximal spaces.

This concerns me because if I were bleaching my own teeth, I would want an even, consistent shade lift throughout the entire exposed surface of my tooth. Do these bleaching strips really do this?

Sincerely,

Shirley Hok

cc: CDA

July 9, 2003

Ms. Shirley Hok
6333 - 93 Street
Grande Prairie, AB T8W 1A1

Dear Ms. Hok:

Thank you for your attention to the most recent scientific issue of Probe. It is good to know that this publication is really of help out there in the field.

Your question is a good one—the strips are flat, so how do they fit a curved surface? I will tell you that as a prudent reviewer of the literature, I am not beyond anecdotal/professional observation; I did try them myself. My results and the results of the test groups in any of the studies did not show any evidence of uneven whitening in the interproximals. When the strips are placed on the teeth, the gelled surface adheres into all the crevices of the dentition. The pressure of the lips also appears to assist in this conformation of the strip to the tooth.

Over the duration time of any whitening process, many users report a "splotchy" uneven whitening process but not with any correlation with contact of the solution to the teeth. This unevenness occurs during the first few days of the whitening regimen and may be due to the actual enamel uptake within the rods. This spotted appearance evens out naturally if the whitening is continued for the recommended time. It is important to inform clients that this may occur and that they should continue to whiten for the duration. As the days pass, this uneven colour blends into an overall brighter result and the clients are satisfied. Most are thrilled with the results.

We should all prepare our clients for the whitening process by attending to what we do best, assisting the client in achieving an overall healthy tissue, with good integrity and a low gingival index. In this way, the whitening products can penetrate the enamel (where they do the most good) and are barred from penetrating the oral epithelium (where they will do no good at all).

Thanks for your letter of clarification.

Yours sincerely,

Marilyn Goulding
Scientific Editor, Probe

Corrections to September/October 2003 issue of Probe:

On the front cover, the caption for the top right photo should read (l to r): Shannon Greenbank, Teri Ostlund, Lana Dahl. On page 231, in the photo at lower right, Susan Matheson was incorrectly identified as Diane Matheson. On page 233, the caption for the middle photo should read (l to r): Jacqueline Desgagne, Veronica Hermiston, Danica Leibel. On page 236, in the list of door prize donors, SIAST (Saskatchewan Institute of Applied Science and Technology) was inadvertently omitted. On page 237, the caption for the top right photo should read (l to r): Sheila Jozsa, Sheila Petrollini, Danica Leibel, Laurie Taylor.

We sincerely regret these errors and apologize to the individuals concerned.

CDHA LONG TERM DISABILITY COVERAGE

July 2, 2003

Dear Editor:

I am writing to share my recent experience with the CDHA Long Term Disability coverage, which is provided through Sun Life Assurance Company of Canada [Sun Life]. In fact, I hope my story will encourage all CDHA members to strongly consider purchasing this coverage; it's an investment in security.

In January 2002, I was shocked to find myself on a medical disability. I never expected to have this kind of health challenge. All the same, I had heard many stories of people, just like me, who had had major medical challenges and their terrible experience with their disability insurer. But this hasn't been the case with me.

I have been remarkably pleased with the CDHA coverage and the service provided by Sun Life. From my first discussion with the case manager, I felt totally supported and have been lead through the process with dignity and respect.

I continued to be served well, even when I was transferred to other case managers. Instead of facing the dreaded paper jungle that can occur when files are transferred, they provided me with all relevant information—quickly, clearly, and again, with respect and care. Considering my health, this level of service has been very important to me; I needed to focus all my energy on getting well.

A rehabilitation consultant contacted me when I was close to returning to work. She created a return-to-work plan that was both realistic and beneficial. I've been returning to work in a graduated way. I am now up to first two and a half days per week and I hope to be at three days per week by September.

I don't even want to imagine where I would be without the CDHA disability coverage and the benefits and service from Sun Life. A number of years ago, I was very hesitant to buy the insurance. After all, I was married and healthy and figured I would be well taken care of if I ever became ill. Well, life has a way of challenging our beliefs. And I can't thank my friend Sheila enough for keeping after me to consider the insurance and not letting up on me until I actually purchased it.

So, to all of you waiting, or thinking, **get disability insurance!** It is worth every penny and I hope you never have to use it.

Yours sincerely,

Donna Wilson
Victoria, British Columbia

Editor's note: Keep an eye out for more information in broadcast e-mails, the next issue of Probe, and on the CDHA web site about the disability and other groups benefits coverage available from CDHA and Sun Life. In the meantime, if you have any questions about the coverage, call Sun Life at 1 800 669-7921 or, in the Toronto area, at 416-408-7390.

Membership Renewal Drive 2003–2004

Have you submitted your renewal for the 2003-2004 membership year? If not, your membership lapsed on October 31, 2003. We also wish to remind you that liability (malpractice) insurance coverage will expire on December 31, 2003 for Active members in the 2002-2003 membership year. Don't delay - send in your renewal **today** to guarantee uninterrupted access to your membership benefits! The Membership Renewal Application form and guide can be printed from the CDHA web site at www.cdha.ca, Members Only section.

Remember that your renewal will take 4–6 weeks to be processed **after** it is received at our Processing Centre. This timeline is important when considering the chart below that outlines important renewal dates for each provincial regulatory body.

Renewal Dates for Regulatory Bodies

Alberta*	November 1, 2003
British Columbia	March 1, 2004
Quebec	April 1, 2004
Manitoba	January 15, 2004
New Brunswick	January 1, 2004
Newfoundland and Labrador	November 30, 2003
Nova Scotia	November 30, 2003
Northwest Territories	April 1, 2004
Nunavut	April 1, 2004
Ontario	January 1, 2004
Prince Edward Island	April 1, 2004
Saskatchewan*	January 15, 2004
Yukon	April 1, 2004

* Alberta and Saskatchewan members: your membership renewal is administered through your provincial associations.



Using Educational Research to Support Change: A Study of the Learning Climate within Dental Hygiene and Dentistry Undergraduate Student Clinics and Laboratories

254

by Margaret Wilson, DipDH, MEd,* and Arthur Deane, BS, MA**

ABSTRACT

The climate for learning within organizations can directly impact the performance of those within the organization. This study investigated the learning climate, as perceived by dental hygiene and dentistry students within their clinics and laboratories, during and following a period of administrative downsizing and curriculum reform at the University of Alberta's Department of Dentistry. Two dental hygiene classes and four dentistry classes were surveyed annually for four consecutive years. The survey tool that was used asked students to rate 10 dimensions of their learning environment including such things as physical facility, learning resources available, value placed upon ideas, and standards. Results indicated that although students were encouraged to learn and were provided with practical help during their clinical experiences, they rated other dimensions of their learning environment poorly. Five of the poorly rated dimensions were targeted for change following the first year of survey administration. The survey results were used to support initiatives within the Department including student-led clinic meetings, the acquisition of mobile storage units for clinics, and a student resource room. Subsequent survey findings indicated an improvement in the overall climate for learning with significant gains in four of the five targeted dimensions.

Key words: student stress, clinical learning environment, learning climate, dental hygienists, dentistry, change

* Adjunct Professor, Faculty of Medicine and Dentistry, University of Alberta. Contact information: 780-492 3208; mpwilson@ualberta.ca

** Associate Professor, Faculty of Education, University of Alberta

INTRODUCTION

I get a knot in my stomach every day when I walk through the front doors of this building. Learning is no longer fun. I come only because I care for the patients I am treating.

— Dentistry IV student

The learning environment is discriminating, discouraging, and frustrating. Nobody cares here anymore.

— Dental Hygiene II student

Following a period of rapid administrative downsizing and significant curriculum change, dental hygiene and dentistry students were clearly unhappy and stressed in their learning environment. In an attempt to determine the cause of the stress and to alleviate it, survey research was undertaken. However, as one second-year dentistry student said:

Often there is a feeling that it doesn't matter what we say in surveys—nothing is going to change around here.

To support the voice of the students, survey results were publicly communicated to students, staff, and faculty and were used to support change.

Educational literature over the past few decades has considered the learning environment and how it influences students of all ages. Adult educators have long recognized the importance of the learning environment and its impact, positive or negative, on student development.¹⁻³ Over time, the literature has identified and explored different dimensions of learning environments to make explicit their importance in the learning process of health science students.⁴⁻⁶

A learning environment is broadly defined as "the entire setting in which learning takes place—the campus and the social milieu, the disciplines that provide the knowledge environment, the students and the arrangements made for them, the teaching and the learning process, and the assessment of learning, instruction, and programs."⁷ The clinical environment in which health science students learn encompasses physical, interpersonal, and organizational elements.⁸ The mood or climate within the learning environment builds from shared perceptions and is subject to change when individual or group perceptions change.⁹ Learning environments have been said to affect everything, including students' motivation to learn,⁶ their self-confidence,^{10,11} and their capacity to think critically.¹² When the learning environment creates anxiety, it can decrease learning.¹³

In health science education, the clinical setting is considered the best environment for student learning because it is here that theory meets practice and experiential learning occurs.¹⁴⁻¹⁶ The clinical environment plays a critical role in the professional socialization process¹⁷ and helps students to construct their knowledge in the context of its future applications.¹⁸ In this environment, students receive their first exposure to ethical clinical practice, professional identities are moulded, and clinical teachers are the primary influence on student learning.¹⁹ Others within this educational setting can also affect learning as they can enhance or detract from student experiences²⁰ even though students may generally view clinical learning experiences positively.⁶

In the last decade, constant and rapid change in the technical and scientific knowledge base has affected health science education.²¹⁻²³ Universities have been pressured to do more with less at a time when the professional education of dental hygiene and dentistry students is transforming to meet the health needs of future generations.^{18,19,24,25}

In the 1990s, major corporations were also changing significantly. In management literature, studies on companies that had downsized indicated that downsizing destabilized the culture of organizations. As well, employees who survive such trauma have lower morale and higher stress and could suffer from a syndrome that is marked with anger and guilt.²⁶ Rotem, Bloomfield, and Southon linked developments in the management literature about learning organizations to the education of health professionals and suggested a number of strategies for improving the clinical learning environment in times of change.⁸

At the University of Alberta, change came abruptly in 1994 when the university's administration announced that the Faculty of Dentistry would be closed. Over the subsequent two years, the dental hygiene and dentistry programs were retained but the faculty was forced to downsize to one department within a restructured Faculty of Medicine and Oral Health Sciences (later renamed the Faculty of Medicine and Dentistry). The curriculum for the dental hygiene and dentistry undergraduate programs was substantially modified and the teaching and support staff within the new Department of Dentistry was reduced by 34%. This rapid change affected the learning environment for dental hygiene and dentistry students but there was little time to prepare students for the changes that occurred during this time period.²⁷

Reacting to concerns about student health and well-being, the quality assurance coordinator in the Department of Dentistry undertook a quality assurance initiative to investigate the apparent student stress.

METHODS AND MATERIALS

The three goals of this research project were to determine the opinions of undergraduate dental hygiene and dentistry students regarding the climate within the learning environment of their clinics and laboratories; to act to improve that climate; and to learn how the students' opinions changed following the actions taken by re-surveying dental hygiene and dentistry classes over a four-year period.

Ethical approval for the research study was obtained from the Faculty of Medicine and Dentistry and from the Faculty of Education. It is not normally necessary to obtain ethical approval from two different bodies within the same university. However, the Department of Dentistry was undergoing substantial restructuring at the time of the study and the

ethics committee could not guarantee a timely review of the project. To expedite the process for the sake of the demoralized student body, each researcher took the study forward to their respective faculty.

Annually for four consecutive years, undergraduate dental hygiene and dentistry students were surveyed to determine their perceptions of the learning environment within the laboratories and clinics administered by the Department of Dentistry. In the first year of the study, three dentistry classes and two dental hygiene classes participated in the study. The fourth-year graduating class of dentistry students was not available for surveying this first year due to the timing of ethical approval. In subsequent years, all four years of dentistry classes and the two clinical years of dental hygiene classes participated. Over the life of the study, 15 classes of dentistry students and 8 classes of dental hygiene students were surveyed.

The study was limited to the two clinical years of the dental hygiene program as the laboratories associated with the pre-professional year of dental hygiene education were not under the administrative control of the Department of Dentistry and the students were not being taught in the same environment.

The survey instrument used in the study was adapted with permission from Pedler, Burgoyne, and Boydell's *Learning Habit* questionnaire.²⁸ This questionnaire was suggested for companies wishing to investigate the learning habits of employees in their organizations. The adapted survey instrument (see Table 1) identified and defined 10 dimensions of a learning environment, including the following:

- physical environment
- learning resources within clinics and laboratories
- encouragement to learn
- communication
- rewards
- value placed upon ideas
- practical help available
- warmth and support
- standards
- respect

The communication dimension of the survey was further broken down into five pathways of communication, representative of the groups with whom the students interacted on a regular basis when in clinics or laboratories. These groups were (1) student to student in the same program, (2) student to student in different programs, (3) support staff in clinics and laboratories to student, (4) dentistry instructors/administration to student, and (5) dental hygiene instructors/administration to student.

A scale with four intervals was used for each of the 10 dimensions in the survey; "1" and "2" symbolized negative ratings while "3" and "4" were considered positive ratings. Table 1 outlines the rating scale for each dimension of the learning climate. Students were asked to rate each dimension and were encouraged to provide written comments to support their ratings.

Data from the returned surveys were entered into MSEXcel® software and the Statistical Package for the Social Sciences (SPSS) was used for statistical analysis. Data relating to the students' perceptions of their learning environment were examined through the calculation of means and standard deviations based on the scoring from 1 to 4. A significance level of .05 was used for all tests of significance and *p* values of more than .05 were not considered statistically significant.

- 1. Physical environment: the clinic.** This includes the quality of space and privacy afforded to people; the accessibility of necessary supplies; and the support for patient treatments.
- | | | | | | |
|---|---|---|---|---|---|
| <i>Poor conditions; difficult to sustain quality treatments</i> | 1 | 2 | 3 | 4 | <i>Excellent conditions; no physical barriers to the delivery of quality patient care</i> |
|---|---|---|---|---|---|
- 2. Learning resources within the clinic and laboratories.** This includes the numbers, quality, and availability of faculty and staff and well as available equipment.
- | | | | | | |
|--|---|---|---|---|---|
| <i>Very few or not available faculty and staff; poor resources</i> | 1 | 2 | 3 | 4 | <i>Many very helpful and available staff and faculty; equipment in good working order</i> |
|--|---|---|---|---|---|
- 3. Encouragement to learn.** The extent to which students feel encouraged to have ideas and learn new ways of doing things on the clinic floor. This would not include experimentation that may put patients at risk.
- | | | | | | |
|---|---|---|---|---|--|
| <i>Little encouragement to learn; low expectations of people in terms of new skills and abilities</i> | 1 | 2 | 3 | 4 | <i>Encouragement to learn at all times and to extend oneself and one's knowledge</i> |
|---|---|---|---|---|--|
- 4. Communication.** This refers to the pathways of information flow from student to student, student to staff, and student to faculty member. [This section was customized to account for the various types of communication possible between the groups.]
- | | | | | | |
|--|---|---|---|---|---|
| <i>Information not openly shared; sometimes discouraged from seeking assistance or information</i> | 1 | 2 | 3 | 4 | <i>Students/staff/faculty are openly willing to pass on information, provide assistance</i> |
|--|---|---|---|---|---|
- 5. Rewards.** This includes students being verbally praised for their efforts, being given recognition for good work. This does not include grading but rather addresses positive verbal reinforcement and recognition of excellence in clinical/laboratory performance.
- | | | | | | |
|---|---|---|---|---|--|
| <i>Students are ignored but blamed first if things go wrong</i> | 1 | 2 | 3 | 4 | <i>Students are openly recognized for good work and rewarded for effort and learning</i> |
|---|---|---|---|---|--|
- 6. Value placed on ideas.** The extent to which ideas, opinions, and suggestions are sought out, encouraged, and valued.
- | | | | | | |
|---|---|---|---|---|---|
| <i>Ideas for clinic-related issues are not sought or valued from students</i> | 1 | 2 | 3 | 4 | <i>Efforts are made to get students to participate in clinic meetings; ideas are valued, acted on</i> |
|---|---|---|---|---|---|
- 7. Practical help available.** The extent to which fellow [dentistry] students, clinic staff, and [dental hygiene] students lend a hand, offer support.
- | | | | | | |
|---|---|---|---|---|--|
| <i>People don't help each other; there is an unwillingness to pool or share resources</i> | 1 | 2 | 3 | 4 | <i>People are very willing and helpful; pleasure is taken in the success of others</i> |
|---|---|---|---|---|--|
- 8. Warmth and support.** This refers to the "friendliness" of others, the amount of trust between students and support staff and the amount of support given to students with a problem.
- | | | | | | |
|---|---|---|---|---|--|
| <i>Little warmth and support; this is a cold, isolating place</i> | 1 | 2 | 3 | 4 | <i>Warm and friendly place; clinic is an enjoyable place to be</i> |
|---|---|---|---|---|--|
- 9. Standards.** The emphasis is placed upon quality in all things; there are no double standards for students. Students within the dental hygiene and dentistry programs are treated equally.
- | | | | | | |
|--|---|---|---|---|--|
| <i>Apathy and double standards exist</i> | 1 | 2 | 3 | 4 | <i>High standards; everyone cares; everyone is treated equally</i> |
|--|---|---|---|---|--|
- 10. Respect.** This refers to the atmosphere in which learning takes place, whether students feel respected as human beings.
- | | | | | | |
|---|---|---|---|---|---|
| <i>Little respect; hierarchical distinctions are constantly made and reinforced</i> | 1 | 2 | 3 | 4 | <i>Students are well respected for their knowledge and skills</i> |
|---|---|---|---|---|---|

Source: Adapted, with permission, from M. Pedler, J. Burgoyne, and T. Boydell, *The Learning Company* (London, UK: McGraw-Hill, 1997)

Table 1. Learning climate survey definitions and rating scale

The textual information, consisting of unsolicited comments written on the surveys, was entered into MSWord® and was reviewed by both researchers to determine the presence of trends or patterns.

After the first year of survey implementation, preliminary results from the study were formally reported to undergraduate dental hygiene and dentistry students, department administrators, clinical support staff, and teaching faculty. Several student-centred solutions resulting from staff-student collaboration were enacted to improve the learning climate within clinics and laboratories. These solutions included monthly student-driven clinic meetings, the creation of a student resource room, purchase of specific equipment, and an increase in the student voice through representation on department and faculty committees.

The survey was re-administered in the spring of the following academic year to two dental hygiene classes and all four years of dentistry students. Survey results, along with the unsolicited written comments, were again shared with faculty, staff, and students and were the driving force for improvement. This cycle of surveying, summarizing results, communicating, planning and implementing interventions for identified problems, and re-surveying to determine student opinion was repeated during the following three-year period.

SURVEY RESULTS

The response rate for students in both programs over the four years of survey administration was good. On average, 84% of

	Two dental hygiene classes (n = 40 per class)	Four dentistry classes (n = 32 per class)	Total number of surveys returned	Response rate (%)
Year 1: 1997	72	64 *	136	77
Year 2: 1998	65	99	164	79
Year 3: 1999	71	88	159	76
Year 4: 2000	60	82	142	68
Total surveys, by program	268	333	601	—
Response rate, by program (%)	84	69	—	75

Table 2. Student response rate to learning climate survey

dental hygiene students and 69% of dentistry students completed surveys. Table 2 summarizes the number of responding students per year per class.

Each class of dental hygiene and dentistry students rated the 10 dimensions of their learning climate within the department's clinics and laboratories according to their unique perceptions. The written comments made by the students told the researchers the "why" behind the positive or negative ratings. These unsolicited comments were found on 100% of the returned surveys the first year the survey was administered.

Results from the first-year survey indicated that students in both programs rated the overall climate for learning as positive, with first-year dentistry and first clinical year dental

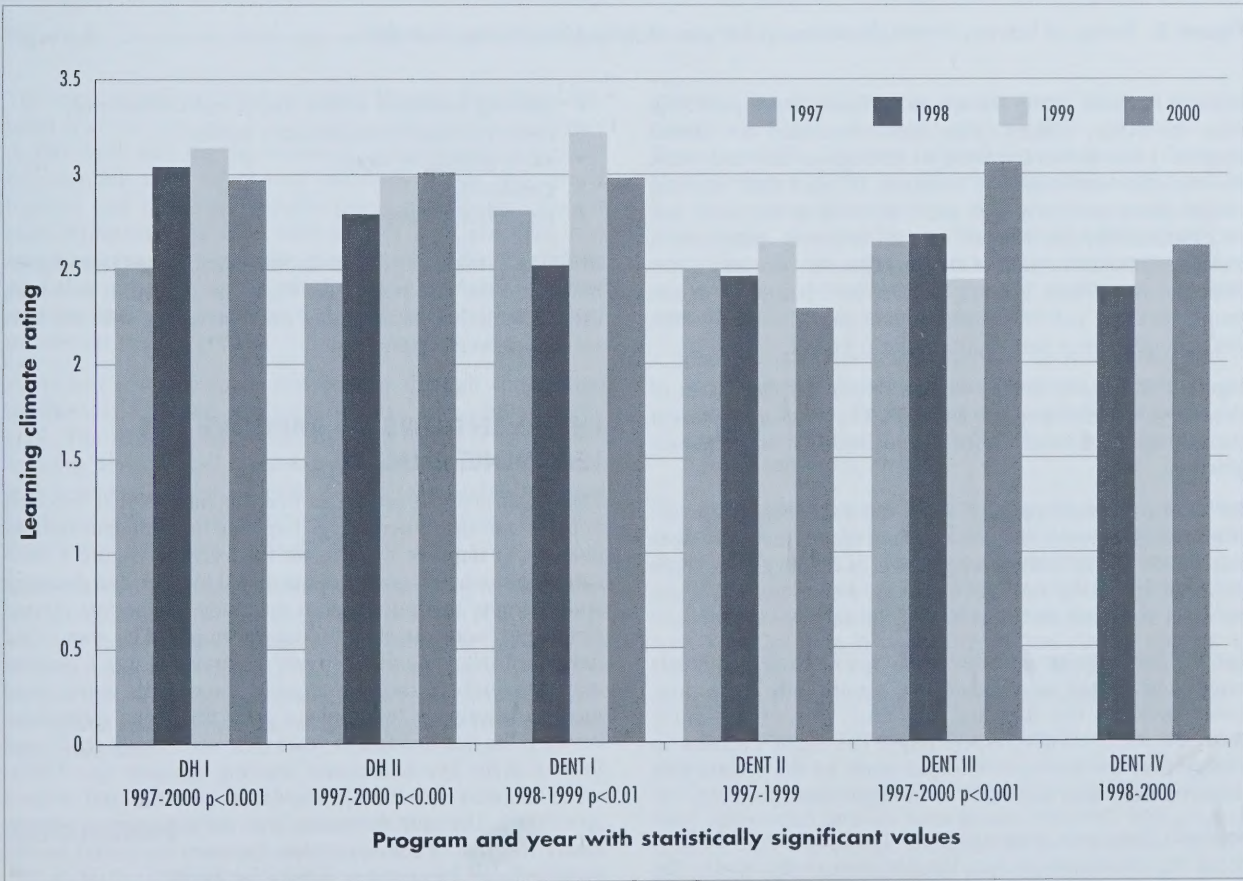


Figure 1. Rating trends for learning climate per class

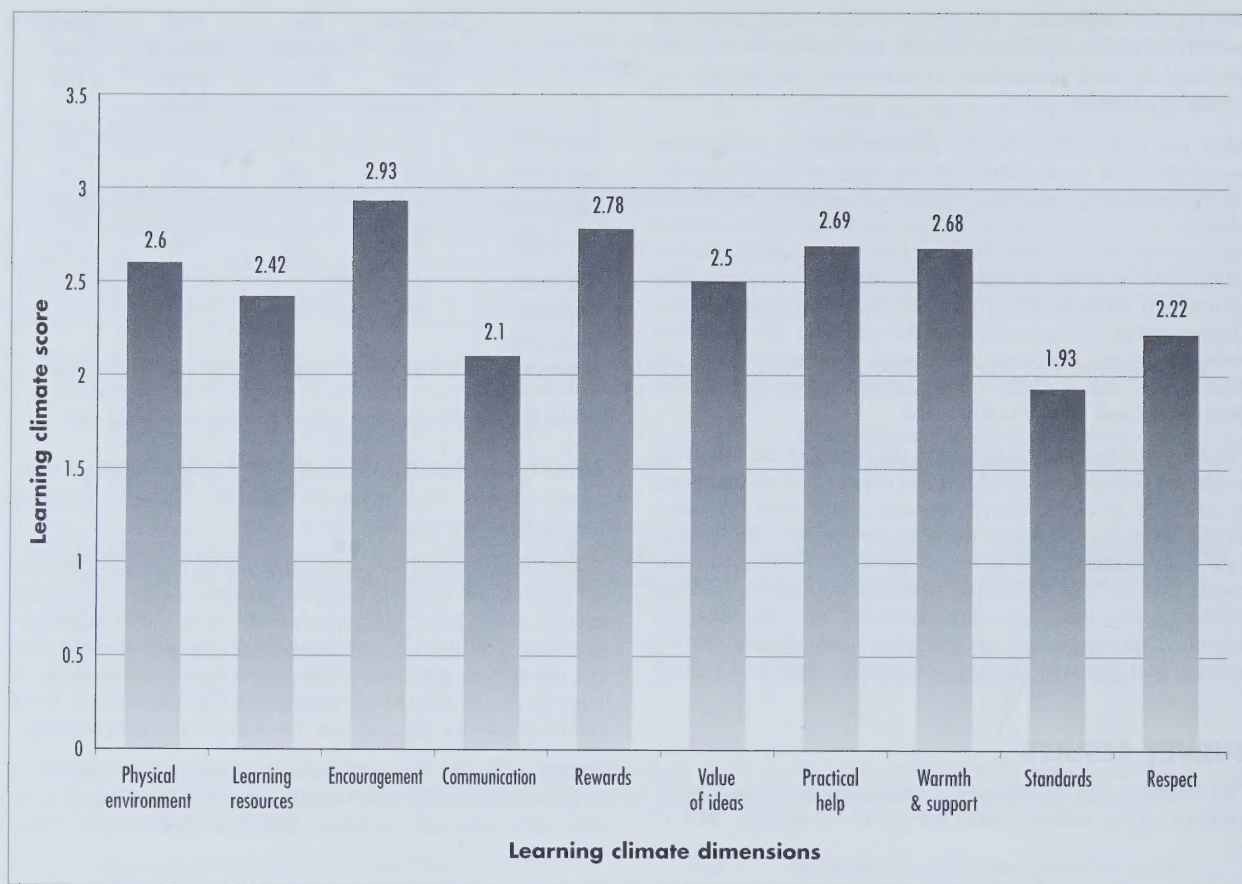


Figure 2. Ratings of learning climate dimensions in first year of study. Mean scores; all students

hygiene students rating the learning climate more positively than the senior classes. This trend continued for Dental Hygiene I and II and Dentistry III throughout the four years the students were surveyed. Dentistry IV rated their learning climate more positively over the four years of the study but not significantly so. Not all classes, however, perceived a steady improvement in their learning climate. Dentistry II, for example, rated their learning climate less positively in the fourth and last year of the study than they did on the first year; the difference was significant at $p < 0.001$.

Figure 1 shows the overall climate ratings for each class of dental hygiene and dentistry students. These ratings represent the averaged scores of the 10 dimensions that were investigated.

For the two dental hygiene classes, the differences in the climate ratings between the first and final year of the study were statistically significant and positive ($p < 0.001$). The slight decrease in rating for the first-year dental hygiene class between 1999 and 2000 was not significant.

For the four dentistry classes, first- and third-year students rated their overall learning climate significantly more positively between the first and the final year of the study ($p < 0.01$ and $p < 0.001$ respectively). The slight decrease in ratings over the course of the four years for the second-year dentistry class was not found to be significant ($p > 0.05$).

Students from both programs rated the department poorly in 5 (of 10) dimensions during the first year of the study. The dimensions that received ratings of 2.5 or lower were

- learning resources within clinics and laboratories,
- communication with dentistry faculty,
- value placed on ideas,
- standards,
- respectful atmosphere.

In Figure 2, the ratings of all 10 dimensions of the learning climate after the first year of the study are plotted. It was from these descriptive statistics that the dimensions with the lowest ratings were determined.

INTERVENTIONS TO IMPROVE THE LEARNING CLIMATE

The department targeted the five dimensions that received poorest ratings when they implemented student-centred changes to improve the climate for learning. Figure 3 indicates the combined ratings of the dental hygiene and dentistry students over the four years of the study for the five dimensions that were targeted for improvement. The trend that developed following the first year of surveying was a positive one with each of the five targeted dimensions being rated more positively by the students over time. The differences between the first and fourth years were statistically significant for four of the five dimensions; learning resources ($p < 0.001$), value of ideas ($p < 0.001$), standards ($p < 0.01$), and respect ($p < 0.001$). The only dimension that did not improve significantly was that of communication between the dental faculty members and the students in both programs.

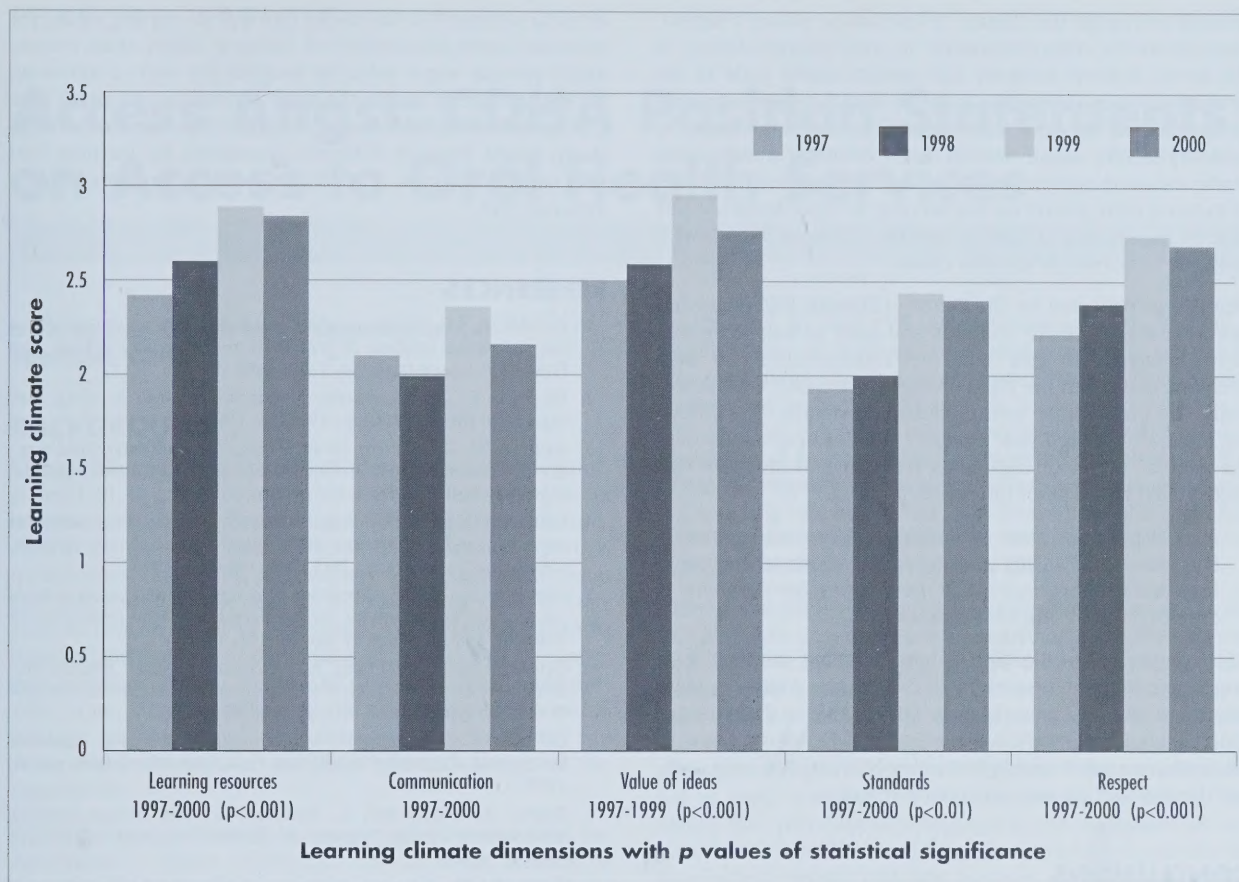


Figure 3. Dimensions of the learning climate targeted for improvement over four years of study

The most significant student-driven change that was instituted after the first year of the study—and one that continues to this day—was the departmental administration's support for monthly clinic/laboratory meetings where the dental hygiene and dentistry students direct the agenda. Elected class representatives from each year of both programs met over lunch hour on a monthly basis. Students determined the operating structure for the meetings and invited faculty and support staff members whom they considered to be important or relevant to their process.

A student resource room was created through cooperation between and among students, faculty, and administrative staff. The administration allocated space within the clinical building and donated a photocopier and furniture. Students and teaching faculty solicited books from publishers and peers to create a small reference library for students. Students determined the "rules for usage" for this quiet space.

Students identified several inequities regarding resource distribution and these were addressed as much as possible, considering the available resources. Lockers near laboratories were re-assigned so students had more convenient space, and mobile units for clinical instruments were purchased so dental hygiene students had the same functional units as the dentistry students.

DISCUSSION

The positive response rate to the survey and the numerous written comments accompanying the returned surveys indi-

cate that the dental hygiene and dentistry students required change in their learning environment. Although the Department of Dentistry administers Instructor Designed Questionnaires (IDQs) to all undergraduate classes and an Exit Survey to graduating years, these instruments ask for student opinion on individual course instructors and course content. They do not explore the physical, interpersonal, and organizational elements of the learning environment. A first-year dental hygiene student stated it best:

Course evaluations exist, but they do not address the issues relevant to students. For instance, they ask students their opinion on whether the teacher communicates clearly rather than whether they [the instructors] have a demeaning attitude.

The more positive overall climate ratings by first clinical year dental hygiene students and first clinical year dentistry students, compared with the other clinical years, may reflect a curriculum with less clinical time and students with limited exposure to the learning climate under study. These students have prior learning in laboratory but not clinical settings so their perceptions of the clinical learning environment may be more idealistic at this point in their professional education.

The dimensions of the environment that did not become positive over the four years of the study involved double standards and communication with dental faculty. Other studies have shown that females have greater concerns with process justice²⁹ and that power relationships exist between all students and their administrators and teachers.⁶ In this study, gender issues³⁰ may have influenced student responses. It is

difficult to change the climate of interaction within a department where the class composition is predominately female in the dental hygiene program and predominately male in the dentistry classes. Comments made by dental hygiene students indicated their thoughts and suggestions were not heard by dentistry faculty administration. Some dentistry students also made the same comments. Because students were not asked to indicate their gender on the surveys, it is not known if this lack of respect was a form of gender discrimination or if it could be attributed to another cause.

Workshops delivered by the Office of Human Rights personnel were organized for students and staff to help ease tensions between students and the administration, to help everyone cope with the rapid changes associated with downsizing, and to improve communication generally. The following remark by a third-year dentistry student best summarizes the general thrust of comments from several students that precipitated this type of intervention:

There have been some breakdowns in communication between dental faculty and the students. We seemed to have all the new things thrust upon us and our opinions are rarely taken into consideration.

Without prior investigation of the learning climate, it is impossible to know how many of the student concerns, identified through this research, were attributable to the administrative changes within the Department of Dentistry. Many of the negative student perceptions may have existed even without the downsizing and curriculum changes.

CONCLUSIONS

Changing the climate for learning within any organization is not a simple task nor can it be achieved quickly. The findings from this study gave the Department of Dentistry a better understanding of how their undergraduate students rated different dimensions of their learning environment. The findings also gave direction to possible interventions. Respect for the student voice was demonstrated by listening to student opinions and acting on their suggestions. This contributed to an improved climate for learning. Results from this study also underscored the importance of preparing students and other adult learners for change.

The downsizing process fragmented and frightened the students and contributed to their stress. By working toward creating an environment in which collaboration and cooperation were accepted and expected, the climate for learning became more supportive and trusting. Student comments changed:

The lab is generally a very comfortable place to learn and the staff and faculty are helpful and mindful of our concerns and stresses.

— Dentistry I student

DIRECTIONS FOR FURTHER RESEARCH

The Pedler, Burgoyne, and Boydell questionnaire, modified for this study, was originally intended for use in business companies.²⁸ Post-secondary educational institutions differ from for-profit companies in many ways including management practices and accountability. A survey instrument that is valid in one environment may not be valid in another. To increase its validity, the modified survey that was used for this study could be administered in other educational settings. Learners are known to be reluctant to give negative feedback in hier-

archical settings¹⁸ so the use of this type of survey, asking for opinions about dimensions of learning rather than people, might provide some valuable insights. As well, a follow-up survey of students within the same institution, five years after the period of upheaval and change that surrounded this study, might uncover different dimensions for learning that may require attention. The clinical learning environment is a dynamic one.

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"Using Educational Research to Support Change"

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Access Angst: CDHA Position Statements on Access to Oral Health Services

by Judy Lux, Health Policy Communications Specialist, CDHA

BACKGROUND

This position paper on access to oral health care has two purposes: first, to gather comprehensive background information on issues related to access to oral health care that are of concern to the Canadian Dental Hygienists Association (CDHA), its members, oral health practitioners, educators, researchers, and policy-makers; and second, to examine the relevant literature to explain issues in some detail and to permit CDHA to base its positions on in-depth analysis. A draft of the paper was posted on CDHA's web site so CDHA members could provide input. Such input assists in developing a consensus among members on the advocacy positions of the Association. Twenty-two members took advantage of the opportunity.

CDHA position statements or recommendations put forth the Association's official position on critical issues relating to access to oral health care; the recommendations were approved by the CDHA Board of Directors on March 22, 2003. These statements will be distributed as needed to policy-makers and the media to communicate and advocate for CDHA's positions. Oral health advocates can also look to these position statements for direction in dealing with important issues affecting the oral health of Canadians. Position statements are supported by research and are based on CDHA's policy goals.

Access to dental hygiene care has been an important issue for CDHA for a number of years. In 1992, the following guiding principle was developed: "Every Canadian is entitled to access comprehensive oral health care. The dental hygiene profession promotes access to affordable oral health care through alternative practice arrangements and non-traditional work settings.... CDHA is committed to the attainment of these goals by working in cooperation with government, health agencies, public interest groups and other health professions."¹ More recently, CDHA developed an end policy or goal: "There are no financial or other barriers to public access to dental hygiene services."² Access is important not only at the national association level but also in all provincial associations.³

While important in the past, access to oral health is now considered a critical issue with the increased evidence that oral and general health are linked. These links include a correlation between periodontal disease and low-birth-weight babies, and some indications of a bi-directional relationship between periodontal disease and cardiovascular disease, respiratory disease, and diabetes.

Canadians' interest in health issues has been heightened recently with discussion centering on funding, accountability, and access. Several important reports helped to frame this discussion and emphasize that Canadians want greater access to

health care: (1) report of the Commission on the Future of Health Care in Canada (the Romanow Commission);⁴ (2) report of the Standing Senate Committee on Social Affairs, Science and Technology (chaired by Senator Michael Kirby);⁵ and (3) the report of the Canadian Institute for Health Information.⁶ Responding to the issues raised in these reports, CDHA developed two briefs that incorporated issues regarding access to oral health care.^{7,8} A third brief—also including access issues—was submitted to the House of Commons Standing Committee on Finance in 2002.⁹

Although statistics and epidemiological information on the oral health of Canadians are limited compared with information available in the United States, a number of important studies make it clear that issues concerning oral health access need to be addressed. Statistics Canada's Canadian Community Health Survey indicates that approximately 62% of Canadians aged 12 or older consulted a dentist/orthodontist at least once in 1999–2000. However, the survey also shows that very sizable subgroups in the population do not have this access.¹⁰ These subgroups with a higher oral disease rate include people with low incomes, seniors, immigrants, persons with disabilities, and Aboriginal peoples.

A number of factors limit access to care—the most obvious is not being able to afford the services. But some lesser known issues include system barriers—restrictive dental hygiene legislation and a lack of coverage by private and public dental care plans. Dental offices exist in most towns and cities across Canada. Access to dental hygiene services, however, is restricted for many individuals due to the cost, difficulties with transportation to private offices, a lack of services in rural and remote areas, and fear of obtaining services.

With access problems so complex, there is no single solution. This paper groups the proposed solutions into three sections: population subgroups, public programs, and system issues. Although some issues are discussed in more than one section, the recommendations/solutions are listed only in the section where the issue is discussed in the greatest detail.

BARRIERS TO ACCESS AND PROPOSED RECOMMENDATIONS

1. Population subgroups

Low-income Canadians

Individuals with low socio-economic status (LSS) have poorer dental health than those in wealthier groups.^{11,12,13,14} This may be due to an inability to pay for services not covered by government programs or by private insurance plans. The U.S. Surgeon General's report in 2000, *Oral Health in America: A Report of the Surgeon General*, points out a significant disparity in oral health between racial and socio-economic groups and the general population.¹⁵ In 2002, a five-country study of

the inequities in health care showed that in Canada, Australia, and the United States, between 20% and 51% of citizens with incomes below the national median said they needed dental care but did not get it because of cost.¹⁶ A 1999 Statistics Canada survey reports a similar finding.¹⁷ When Canadians were asked why they did not seek needed dental care, 20% of the lowest income group mentioned cost; this compares with just 10% of the highest income group.

Children from LSS families are particularly susceptible to oral health problems and severe tooth decay.^{18,19,20} The serious unmet needs are highlighted by the following statistics:²¹

- LSS children suffer twice as many dental caries as do their more affluent peers.²²
- More than 51 million school hours are lost each year to dental-related illness.
- LSS children have nearly 12 times the number of restricted-activity days as do children from higher-income families.
- Twenty-five per cent of LSS children never visit a dentist before entering kindergarten.

Children from LSS families are not only more susceptible to poor oral health; their general health is also compromised since healthy teeth contribute to a child's health, growth, and development. Children's teeth are involved in eating, development of proper speech, and normal jaw development. They also guide the permanent teeth into proper position and contribute to a child's appearance and healthy self-esteem. Severe dental decay undermines the quality of life of young children through pain, problems in sleeping, eating, and behaviour, and can contribute to "failure to thrive."²³

Many policies to increase access and attack the disparities in oral health status between low and high socio-economic groups assume that free services will result in better oral health status. A recent legislative initiative in the United States, the Children's Health Insurance Program for low-income children, was based on this premise. Findings from the Rand Corporation Health Insurance Experiment—which compared oral health status of those receiving a free service and those enrolled in plans with co-payments—also supported the assumption.²⁴

However, Ismail and Sohn's study on a universal, publicly financed dental care program in Nova Scotia challenges this premise. The study shows that the differences in oral health status between children of families with a low level of education and those with a high level cannot be reduced or eliminated solely by providing universal access to oral health care.²⁵ The researchers point out that access alone cannot eliminate dental caries. Efforts should also focus on understanding the determinants of oral health—socio-economic, behavioural, family, and community. They conclude that inequalities in oral health should be addressed not only with professional dental care programs but also by a combination of programs including community-based preventive services, general oral health promotion programs (such as school-based education), and mass media promotion of the appearance of a person's teeth and smile.

CDHA recommends that

- provincial governments across Canada provide basic oral health programs and services, including necessary restoration, maintenance, prevention, and health promotion services, for LSS individuals and their families including the working poor; these programs and services

should take into account the determinants of oral health and include clinical service, community-based oral health promotion and disease prevention programs, and be based on a comprehensive plan that includes programs in schools and for new mothers and immigrants.

Seniors

There is a proliferation of oral health care statistics showing that tooth decay and periodontal disease²⁶ increase with age; the data support the need for increased access for the elderly to preventive primary oral hygiene care. Some Canadian and United States statistics are as follows:

- The root caries rate was more than three times greater for seniors over the age of 65 than for those under age 45.²⁷
- For people aged 65 to 74, 31% had decayed or filled tooth surfaces, compared with 10% of people aged 18 to 24.²⁸
- Cancers of the lip, tongue, mouth, gum, pharynx, and salivary glands increase with age.²⁹
- Over half of adults aged 55 or more have periodontitis.^{30,31}
- Although 43% of Caucasians aged 75 were missing all their teeth, the percentage was higher in other multicultural groups, for example, African Americans with 53% and Mexican Americans with 44%.³²
- Of homebound seniors, 60% to 90% reported a need for dental services but only 26% reported visiting a dentist at least once every two years; 12% to 16% had not visited a dentist in over five years.^{33,34,35}
- For seniors in institutions, 9% to 25% see a dentist once a year; 30% to 78% have not visited a dentist in over five years.^{36,37,38}
- Although older adults have some of the highest rates of oral disease, they continue to be the lowest users of oral health care.³⁹
- A summary of six studies indicates a high degree of dental disease and unacceptable levels of oral health in residents of nursing homes and long-term care facilities.^{40,41,42}
- There are significant unmet dental needs in long-term care facilities: dental prostheses in poor condition, poor oral hygiene, and a high prevalence of disease including denture stomatitis,⁴³ periodontal diseases, and caries.^{44,45}

Despite this established need, seniors—particularly those in long-term care facilities (LTCFs)—have trouble accessing services due to poverty, restricted mobility, transportation difficulties, poor overall health, and long-term care facilities with a limited capacity to deliver oral health services. As well, retirement often means losing private dental insurance. The startling fact is that in Canada, 75% of senior men and 83% of senior women do not have dental insurance.⁴⁶ This lack of coverage for women, who account for up to three-quarters of the institutionalized elderly,⁴⁷ indicates that the provision of oral health care services in LTCFs is an important women's issue.

Access for seniors can also be restricted by issues related to oral health service providers. Some dentists are reluctant to treat seniors due to a perception that seniors do not have the patience, endurance, or finances to undergo treatment; that they require more chair time; and that treatment is more difficult.^{48,49} The caregivers in LTCFs providing daily oral hygiene report that it is given low priority because caregivers see oral care as invading an individual's privacy; they view oral care as the most undesirable task—over changing dia-

pers, feeding, and hair washing; they have difficult and uncooperative patients.⁵⁰

Perry identifies several other barriers to providing access to oral health care in LTCFs.⁵¹ She notes that it is sometimes difficult to obtain consent and payment for treatment when a third party has power of attorney. When there is disagreement about the need for oral health services, the dental hygienist can help resolve the issue, acting as an advocate and educating the third party about the value of oral health as an integral part of overall health. Perry also discusses the challenge of working with LTCFs' administration to provide education on the role of the dental hygienist, the importance of oral health, and the need for the dental hygienist to view a client's health records prior to providing service.

When daily caregivers lack knowledge about oral health, seniors' access to care in LTCFs can be limited. A LTCF pilot project in Winnipeg shows the success of having dental hygienists educate nurses, nursing assistants, and speech language pathologists. The report of this project suggests education should focus on oral health and its connections with overall health, the causes and prevention of oral disease, and how to perform mouth care.⁵² Matear argues for the need to create preventive oral health care programs for the institutionalized elderly that include not only examinations and preventive care but also education for the allied health care professionals and the patients' families.⁵³

Changes in LTCF regulations can increase access and protection for vulnerable seniors. An example is British Columbia where the Adult Care Regulations (1980) of the Community Care Facility Act now require the licensee of the long-term care facility to "encourage a resident to obtain an examination by a dental health care professional at least once every year" and ensure "that staff develop and implement an individualized [oral health] care plan."⁵⁴ This regulation defines the dental health care profession as a dental hygienist, denturist, or dentist. Other legislative advances in British Columbia include the establishment of the Residential Care Registration (RCR) category for registrants with the College of Dental Hygienists of British Columbia. Clients of RCR dental hygienists are exempt from the requirement for an annual examination by a dentist and these dental hygienists are very active in long-term care facilities.

Supervision requirements for dental hygienists, which vary from one province or territory to another, and the 365-day rule in British Columbia also have a negative impact on seniors' access to oral health services. (These provincial requirements are discussed in more detail in Section 3.) The following example from Ontario shows how that province's supervision requirements affect the ability of dental hygienists to provide care in LTCFs.

LTCFs in Ontario are legally obligated to provide clients with access to yearly oral assessments.⁵⁵ An unnecessary barrier, however, complicates this provision of care because dental hygienists require an order from a dentist prior to scaling. A standing order may be given for individuals with a clear medical history, who are not taking medications, and where no pre-medication is required to perform scaling. However, as Perry points out, few elderly persons living in LTCFs have a clear medical history. They must therefore visit a dentist for an examination and review of their medical history prior to scaling.⁵⁶

Dental hygienists across Canada have considerable interest in serving the senior population in LTCFs but provincial legislation limits their ability to do so. Internationally, there is also

an interest in expanding the role of dental auxiliaries with particular emphasis on providing services to clients with special needs due to illness or disability.⁵⁷ For example, South Australia passed legislation to allow dental hygienists to provide preventive oral health care services to patients in nursing homes and places of long-term residential care.⁵⁸

CDHA recommends that

- provincial governments
 - provide funding for oral health services in long-term care facilities (LTCFs);
 - revise legislation to allow dental hygienists to provide dental hygiene services in LTCFs;
 - implement LTCF legislation requiring the development and implementation of oral health care plans for residents that include a daily oral care strategy;
- long-term care facilities
 - provide educational oral health sessions for staff and clients' families;
 - establish oral health care policies and protocols;
 - ensure that health care/nurses aides provide daily basic oral hygiene care to residents who are unable to manage their own care.

Rural, northern, and Aboriginal communities

The president of the Inuit Tapiriit Kanatami emphasized the importance of providing health services in remote areas when he stated: "I believe that...the success of our health care system as a whole will be judged not by the quality of service available in the best of urban facilities, but by the equality of service Canada can provide to its remote and northern communities."⁵⁹ Canada unfortunately has long struggled to provide access to health services, including oral health services, in its vast, sparsely populated areas but the report card in this area has very low marks.

Aboriginal peoples' oral health is appalling. A wide gap exists between the oral health status of Aboriginal and non-Aboriginal children. In 1999, the decayed/missing/filled teeth (DMFT) rate for 12-year-old Canadian First Nations children was 4.4, two to three times higher than the DMFT rate for non-Aboriginal children in Canada.⁶⁰ A more recent statistic from 1999–2000 indicates the dental decay rates for First Nations and Inuit people of all ages range from three to five times greater than the non-Aboriginal Canadian population.⁶¹

The Non-Insured Health Benefits (NIHB) program provides oral health services to Aboriginal peoples but fails Aboriginal peoples due to underfunding, uncoordinated services, and difficulties with benefits administration. In addition, limited numbers of professionals work in rural and northern communities so services are either non-existent or require lengthy travel.

An oral health professional working with the NIHB program reports: "Most First Nations people don't get much dental care; only 38 per cent see a dentist once a year, compared to 75 per cent of the rest of us."⁶² This is confirmed in a report indicating the program reaches only 38% of the eligible population since oral health providers are not located in all of the areas where Aboriginal peoples live.^{63,64} In some communities such as Moose Factory, eligible NIHB clients lack access to dental care because there are no oral health care providers in these areas.⁶⁵ Northern towns cannot attract new dentists because "the red tape scares them away...even \$15 proce-

dures must be pre-approved.⁶⁶ Even the dentists who are providing services in Aboriginal communities are opting out of the NIHB program because of the lengthy administrative requirements.^{67,68,69} A First Nations and Inuit Health Branch report of June 17, 2002 on a new Oral Health Plan also shows that providers and clients find program coverage and services confusing with substantial administrative requirements.⁷⁰

Human resources and administrative problems are not the only problems plaguing the program. The mandate—to provide restorative treatment—does not adequately support long-term preventive oral health⁷¹ and a cost-benefit analysis shows little value is obtained for the expenditures.⁷² A long-term oral health mandate that includes oral health prevention can result in program financial savings since “children with extensive dental disease have extensive dental disease as adults.”⁷³

The one redeeming aspect of this program is its use of dental therapists who provide primary oral health care services in the territories and First Nations communities in all provinces but Ontario and Quebec. The Canadian Association of Public Health Dentistry reports using dental therapists brings effectiveness and efficiencies to the program.⁷⁴

Commissioner Romanow's 2002 report, *Building on Values: The Future of Health Care in Canada*, attempts to address some of these access issues. It describes a method for financing, organizing, and delivering health care to Aboriginal peoples that involves creating Aboriginal Health Partnerships.⁷⁵ These partnerships will have the following features:

- consolidated funds provided by the federal, provincial, and territorial governments and Aboriginal organizations with framework agreements negotiated on a provincial or territorial basis;
- health care services restructured around prevention;
- services adapted to the social and cultural realities of different Aboriginal communities.

CDHA recommends that

- the federal government implement Commissioner Romanow's recommendation for an Aboriginal Health Partnership;
- the federal government increase funding for both the Community Health and NIHB programs of the First Nations and Inuit Health Branch of Health Canada, so that
 - there is an interprofessional approach to health and wellness that involves an oral health component;
 - additional oral disease prevention and oral health promotion programs can be created and carried out by dental hygienists, including mobile dental hygienists serving remote areas;
 - a comprehensive national preventive initiative can be carried out to address dental disease in young Aboriginal children;
 - the NIHB program can be streamlined to reduce administrative requirements;
 - adequate basic oral health programs and services can be provided including necessary restoration, maintenance, prevention, and health promotion.

Persons with physical, developmental, and psychiatric disabilities

The oral health of individuals with special health care needs may be affected negatively by medications, therapies, or special diets; or by their difficulty with cleaning teeth thoroughly on a daily basis. For example, children and adolescents with developmental disabilities are at high risk for enamel irregularities, gum infections, delays in tooth eruption, moderate-to-severe malocclusion, and oral infection.⁷⁶ Individuals with Down syndrome also have increased oral health problems. Pilcher conducted a study of children and adolescents with Down syndrome, reporting a high incidence of periodontal disease, xerostomia, fissuring of the tongue and lips, and malocclusion.⁷⁷ Finally, children and adolescents with cleft lip/palate are at increased risk for dental caries, gingivitis,⁷⁸ cross bite, and crowding.⁷⁹

Although persons with disabilities may have higher oral health needs than the general population, results of the 1994–1995 United States National Health Interview Survey (NHIS) indicate that oral health care is the most prevalent unmet health need for children with disabilities.⁸⁰ A survey of 774 case managers serving 18,333 developmentally disabled clients shows why their clients could not obtain oral health care:⁸¹

- 47% were refused treatment in the last 12 months;
- 72% indicated that there were not enough dentists in the community who were willing to treat people with disabilities.

Other U.S. studies report similar oral health access problems for persons with developmental disabilities. Some of the issues include⁸²

- dentists' unwillingness to treat disabled persons because of inadequate training, time involvement, and increased malpractice liability if sedation is used;
- a lack of dentists who accept Medicaid reimbursement;
- behavioural problems;
- families' transportation problems.

In addition, the California Dental Access Project report points out the negative impact that private practice has on access for persons with developmental disabilities. Most dentists practise in private settings. The result is a lack of connection to general or specialty medical expertise and support, as well as a lack of connection with community organizations and services for people with disabilities.⁸³ Improved connections between health professionals and community organizations may make it easier for oral health care professionals to provide appropriate services for persons with developmental disabilities.

Physical barriers—such as inaccessible offices, an inability to travel, or difficulty obtaining public transportation—prevent persons with physical and developmental disabilities⁸⁴ from obtaining oral health services at private clinics or offices. Persons with psychiatric disabilities likely find many of the same access problems as persons with developmental or physical disabilities.

Since most dental hygiene services are portable and can be delivered on-site, non-traditional delivery models such as mobile dental hygiene services can help solve the access issue for many people with disabilities. A program in the United States has devised a way to bring basic dental care to people

with disabilities in the community. In Missouri Elks, a 30-year-old mobile oral health program for children with special health care needs is based on a public/private partnership involving a trust, a department of health, and a medical centre.⁸⁵ Basic dental care is free to medically and financially eligible clients and is provided in three vans that drive to designated locations. In Canada, the York Region Dental Hygienists' Society in Toronto presented another solution. Since 1999, volunteers have made home visits to provide oral health services for clients with amyotrophic lateral sclerosis (ALS).

The literature reviewed for this paper is predominantly from the United States. This suggests a need for increased Canadian oral health and disability research.

CDHA recommends that

- provincial governments provide
- funding for oral health services for persons with disabilities with LSS, including basic oral health programs and services, including necessary restoration, maintenance, prevention, and health promotion;
- public oral health care services in collaboration with other health services.

Multicultural issues

One's ethnicity influences oral health and access to oral health care. In Ontario, Aboriginal children and children born outside of Canada have fewer healthy teeth, higher scores of decayed/missing/filled teeth (DMFT), and more untreated decay than other children.⁸⁶ Statistics in Vancouver indicate that 64% of Vietnamese children over the age of 18 months had nursing bottle decay, compared with only 5% in the general population.⁸⁷

Two important health care reports of 2002 highlight the importance of multicultural issues in health care. The Romanow Report, Recommendation 29, states: "Governments, regional health authorities, and health care providers should continue their efforts to develop programs and services that recognize the different health care needs of men and women, visible minorities, people with disabilities, and new Canadians."⁸⁸ Senator Kirby's final report also recommends strategies for increasing the supply of health care professionals from under-represented multicultural groups, such as Canada's Aboriginal peoples, and in underserved regions, particularly the rural and remote areas of the country.⁸⁹

Multicultural representation in health care professions is important. This is underscored by a study showing that health professionals from minority communities, including dentists and physicians, are more likely to serve these communities than are non-minority health professionals.^{90,91} The under-representation of multicultural health care providers is substantiated by a U.S. study showing that the racial and ethnic diversity of dental professionals is not consistent with the general population.⁹² The researchers argue that this restricts access to care for many citizens who would feel more comfortable receiving service from providers with a similar cultural background. The supply of dental hygienists and dentists from multicultural backgrounds is determined by the number of multicultural individuals graduating from educational institutions. Thus, there may be a role to play for educational institutions in this issue.

In Aboriginal communities in northern Canada, there is not only a lack of cultural representation within health care providers; non-Aboriginal health care providers can also lack understanding of cultural issues. Commissioner Romanow proposes a solution to this in his final report. He identifies a need to recruit new Aboriginal health care providers and increase training in cultural issues for non-Aboriginal health care providers.⁹³

CDHA recommends that

- governments and health care providers continue their efforts to develop programs and services that recognize the different health care needs of seniors, Aboriginal communities, persons with disabilities, low-income citizens, and multicultural communities;
- dental hygiene education institutions
 - develop admission policies that take into account an awareness of demographic patterns and cultural needs of various communities;
 - include more educational components that raise awareness of linguistic, cultural, and social differences.

2. Public programs

This section deals with oral health financing through the federal, provincial, and territorial governments. Although some municipal governments provide public oral health programs, no comprehensive review of these programs is available.



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Federal programs

The federal government provides funding for oral health programs in Health Canada's Non-Insured Health Benefits (NIHB) program for Aboriginal peoples, Citizenship and Immigration Canada, Correctional Service Canada, Royal Canadian Mounted Police, Veterans Affairs Canada, and Canadian Forces.

Provincial and territorial programs

Provincial and territorial public oral health programs are listed on the Canadian Association of Public Health Dentistry (CAPHD)'s web site at <www.caphd-acsd.org/programs.html>.⁹⁴ This shows public oral health care coverage at this level varies greatly and is neither comprehensive nor universal. All 10 provinces and the Northwest Territories provide some form of oral health coverage for social assistance recipients; Nunavut and the Yukon do not. However, the majority of the population in Nunavut and the Yukon are eligible for oral health services through the Non-Insured Health Benefits program for First Nations and Inuit peoples. Across Canada, the limitations on services vary for social assistance recipients. Some areas provide emergency coverage (relief of pain or infection); others, basic coverage (restorative and preventive); and a limited few, comprehensive coverage (restorative, preventive, and prosthetic). All provinces and territories—except for British Columbia, Manitoba, and New Brunswick—have special programs for children. Only Alberta, British Columbia, New Brunswick, and Ontario have programs specifically for persons with disabilities. Alberta and the Northwest Territories offer programs for seniors (with a maximum income requirement). Prince Edward Island is the only province or territory with a long-term care facility program. Finally, school-based programs are provided in the Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, and northern Saskatchewan with most of the programs offered only in targeted, high-risk schools.

The CAPHD list of provincial and territorial oral health programs is an important first step in identifying the differences between provinces. But these differences highlight the need for additional research to compare and evaluate programs across Canada.⁹⁵ The research should also show the oral health status of citizens of each province or territory and how public programs address the different needs in the provinces or territories. These differing needs are highlighted in a Saskatchewan study showing that one in five Saskatchewan children has an oral health status below the level found in the Third World.⁹⁶ Canadians need to know how their provincial/territorial government is addressing health issues. There is also a need to document the history and current status of municipal programs since there are signs that municipal public health departments across Canada are divesting themselves of oral health programs.

With increased evidence of a link between oral health and overall health, it seems inconsistent to reduce public funding for oral health programs. Part of the problem is the increased competition for health care dollars that has had a particularly negative impact on public oral health programs. For example, in May 2002, Nova Scotia changed its universal program for children to a payor-of-last-resort program⁹⁷—coverage is provided only for clients with no other oral health coverage. Ontario also made a similar move. Here, prior to 1992, social service recipients were entitled to basic dental care—regular checkups and preventive services as well as emergency care. Now the modified program covers only emergency services,

defined as “an immediate circumstance where the patient appears in immediate suffering, requires care and immediate appropriate treatment is instituted to correct the problem.”⁹⁸ Root canal treatment is not covered, only the alternative treatment of pulling the tooth.⁹⁹ The decreased funding for public oral health programs may have had an impact on the deployment of dental hygienists. In the CDHA report *Dental Hygiene Practice in Canada 2001*, which compares data over the last 24 years, the proportion of dental hygienists working in public health decreased threefold, from 13% in 1977 to 3.8% in 2001.¹⁰⁰

The health care debate in Canada is polarized: some assert that the federal budget cannot increase funding for the health care system; others call for increased funding. According to a survey in 2000 of 1,200 Canadians and 800 health care providers and managers, Canadians are concerned about the range of care covered under the public system and about the funding of the system.¹⁰¹ A close examination of the range of care under the public system reveals limited funding for oral health services. In fact, statistics show that the burden of oral health care expenses falls on individual Canadians. Governments are responsible for only 15.27% of these expenses.¹⁰² As well, from 1975 to 1998, government contributions decreased by 1.7%.¹⁰³ This shows we *do* have reason to be concerned that the government is not taking adequate responsibility for oral health expenses and access to oral health services.

There are concerns with public oral health at both the macro and the micro level. Individual Canadians are having difficulty obtaining services at private offices where the majority of public oral health money is spent. The Ontario Dental Association confirms that dentists are discouraged from providing services to clients who have public coverage, due to time-consuming administrative requirements and low reimbursement levels.¹⁰⁴ These problems were confirmed in a 1994 study at the West Central Community Health Centres in Toronto that showed 23% of family benefits clients and 20% of general welfare clients were refused treatment by a dentist.¹⁰⁵

CDHA recommends that

- federal/provincial/territorial governments conduct surveillance research on
 - Canadians' oral health status, which allows a comparison based on geographical area, gender, age, income, and multicultural status;
 - public oral health programs and their ability to meet the need and demand for preventive oral health care;
- federal/provincial/territorial governments
 - use the above research when prioritizing funding and developing effective, relevant oral health care programs;
 - expand public health promotion and disease prevention programs in schools, community health centres, and LTCFs;
 - streamline the administrative requirements in public programs to ensure easy filing of claims and better align the fee payment for oral health services with market rates.

3. System issues

Legislation, health human resources planning, and an alternative oral health care delivery system

Human resources are a significant concern for health care managers and policy-makers. Some say it is their biggest challenge over the next few years; others label it a crisis.¹⁰⁶ Since wages, salaries, and fees account for approximately three-quarters of health care expenditures, health personnel must be used efficiently to ensure a cost-effective delivery system. Some health economists in Canada suggest that human resource substitution, which can lead to cost efficiencies, is a fundamental aspect of health human resource planning.¹⁰⁷ However, except for a limited use of nurse practitioners, the introduction of midwives, and the substitution of dentists by denturists, human resource substitution has not been seriously attempted despite considerable evidence of its cost-saving potential.¹⁰⁸

Senator Kirby's 2001 report on health care recommends a spectrum approach to human resources, similar to human resource substitution. A spectrum approach is based on the idea of valuing the particular strengths of each profession, rather than using a hierarchical approach to human resources. The report points out that "Canadians have been led to believe that they must see a doctor, when they could well consult a nurse or a nurse practitioner..."¹⁰⁹ In a similar vein, Senator Wilbert Keon—chief executive officer of the University of Ottawa Heart Institute—once said that we have too many doctors doing what nurses should be doing; we have too many nurses doing what nursing assistants should be doing; we have too many technicians doing what clerks and administrators should be doing.¹¹⁰

Wilbert Keon's statement, embodying the human resource substitution model, can also be applied to the field of oral health. CDHA maintains that Canadians have been led to believe that they must see a dentist when they could consult a dental hygienist. As a result, too many dentists are doing what dental hygienists should be doing. In 2000, the ratio of dental hygienists to dentists per 100,000 population was 48:56.¹¹¹ If the ratio of dental hygienists to dentists increased, the access to preventive oral health care would improve. To improve access and efficiency in the oral health system, Manga calls for an increase in the ratio of dental hygienists to dentists in the *Political Economy of Dental Hygiene in Canada*. He calls for an optimal allied-dental-personnel-to-dentist of 5:1 to 10:1.¹¹²

The Employer Committee on Health Care—Ontario (ECHCO) is also interested in new models for delivering dental care to employees. Because of cost increases of about 21% between 1992 and 1993, ECHCO sent a letter to the Ontario Dental Association indicating that ECHCO intended to pursue new models for the delivery of dental care to employees.¹¹³ ECHCO suggests that these new models may include reimbursement schedules determined by insurers and/or employers as well as capitation plans. Dentists paid under a capitation plan would receive a set amount, depending on the number of clients they serve. On the one hand, capitation plans may encourage dental offices to emphasize preventive oral health since payment is not based on the number or type of services rendered. However, some capitation plans incorporate elements that prevent users from accessing the provider of their choice.

Unnecessary and restrictive provincial dental hygiene legislation that requires supervision, an order, authorization, or

directions from dentists makes it more difficult to bring about change or to reduce barriers to oral health care delivery. For example, British Columbia legislation makes it mandatory that a dentist examine the client prior to or during the client's initial appointment with a dental hygienist; and at the time of any subsequent appointment, the client must have been examined by a dentist within the previous 365 days. Saskatchewan legislation requires dental hygienists to be employed by or to practise under contract with (a) an employer who employs or has established a formal referral or consultation process with a dentist or (b) a dentist. In Ontario, dental hygienists must have an order from a dentist to perform a controlled act of scaling and root planing, including curettage of the surrounding tissue.

These limitations mean the majority of dental hygienists must work alongside dentists in dental clinics or offices. Many dentists argue that this mode of service delivery should not change since patient safety is compromised in unsupervised settings. However, Manga documents numerous studies showing this is not the case.¹¹⁴ Existing dental hygiene education is comprehensive and sufficient to allow dental hygienists to provide dental hygiene care safely and competently in alternative practice settings. However, in some areas dental hygienists are forced to maintain traditional delivery systems and are unable to practise in communities without a dentist.

A report by the Commission on the Future of Health Care in Canada supports in principle the removal of restrictive provincial dental hygiene legislation. This report recommends that governments and health care employers take a role in changing legislation and employment agreements to better match health care practitioners' jobs to their training.¹¹⁵ The recommendation argues that allowing more people to perform a wider range of services will improve access to health care; will help solve staff shortages, especially in underserved areas; and will also increase the system's cost-effectiveness. Manga supports this concept when he emphasizes that changing legislation to allow for direct access to dental hygiene care is "unquestionably the single best reform of the oral health care system throughout Canada."¹¹⁶

Provincial and territorial dental directors also agree in principle with this type of legislative change. They indicate that the provincial/territorial legislation pertaining to dental hygienists is written with only the traditional dental practice setting in mind.¹¹⁷ This leads to difficulties in implementing dental hygiene programs and services in non-traditional practice settings such as long-term care facilities, community health centres, schools, community clinics, and public health settings. Although legislation is a provincial/territorial responsibility, the dental directors call for leadership from the federal government to ensure that the legislation is reviewed, especially as it pertains to improving access to care through alternative, non-traditional delivery systems.

Removing restrictive legislation will have a number of positive impacts. The oral health care delivery system could be reorganized to allow the public to consult the most appropriate oral health care professional, be it a dentist, dental hygienist, or denturist. The public could access dental hygienists directly without first having to see a dentist. The public could then obtain dental hygienists' services in non-traditional locations outside of dentists' offices or a clinic. This would allow a more people to access services in a larger number of settings—an increased choice for consumers and service in convenient locations. One of the most significant advantages would be increased opportunities for mobile dental hygiene services in remote and rural areas and in residential facilities.

These mobile oral health services appear to be well established in California with the majority of staff relying on combination funding, including grants or contracts with government agencies, private foundations, and service clubs as well as donations from individuals, alumni of dental schools, and larger institutions such as dental schools.¹¹⁸

Another significant advantage to removing restrictive legislation is that dental hygiene services could be integrated into general health services. This integration is currently limited as about 85% of dental hygienists work in traditional dentists' private practices, with another 8% to 10% in public health, and about 3% in teaching and administration.¹¹⁹ A number of public health experts advocate this integration since it facilitates a comprehensive approach to health.¹²⁰

One of the strongest arguments for integrating oral health services into general health services is recent research that indicates a link between oral health and general health and that suggests gains could be made in the health delivery system by integrating these two areas. Substantial evidence for this link is found in the Surgeon General's report¹²¹ with a number of other studies supporting this link. A 1996 study¹²² showed that if a pregnant woman has gingivitis, she is seven times more likely to have a premature, low-birth-weight baby (PLBW). Another study in 1998¹²³ showed a correlation between maternal periodontal diseased sites and low-birth-weight babies. Lopez et al. also conducted randomized controlled clinical trials and found that periodontal therapy significantly reduces the rate of PLBW babies.¹²⁴ There is also a possible link between periodontal disease and major health problems including cardiovascular disease, infective endocarditis, stroke,¹²⁵ respiratory diseases (such as aspiration pneumonia),^{126,127} osteoporosis, and diabetes.¹²⁸ In addition, dental plaque is a possible reservoir for *Helicobacter pylori*, a causative micro-organism of chronic type B gastritis and peptic ulcer disease.¹²⁹

Other drawbacks exist to the delivery of oral health in the existing private practice model. This model relies on the individual patient to have the resources, transportation, initiative, and understanding of the importance of oral health. Unfortunately, many individuals from hard-to-serve populations do not have these advantages that would allow them to maintain their own and their family's oral health properly.¹³⁰ A more efficient system would bring the oral health service to the high-needs population or would involve a population-based strategy, rather than focusing on service delivery to individuals. The integration of oral health services into general health services may be considered a population-based strategy that will provide important solutions to the access problem for the underserved.

Some population-based strategies that would benefit the hard-to-serve populations include oral health services in primary health care settings, community health centres, outreach clinics, mobile oral health units, home care, and LTCFs. Other examples include dental hygienists providing a provincial dental sealant program in schools and hospital-based oral health clinics. Such a program exists at the Children's Hospital of Eastern Ontario dental clinic for hard-to-serve and medically compromised children, including those with developmental disabilities or cancer. Dental hygiene programs can also be incorporated into existing community health centres, similar to the program offered at the West Central Community Health Centres in Toronto.¹³¹ These options would reduce the unmet oral health needs of various socio-economic and demographic population groups in Canada, including isolated

individuals, the frail elderly, persons with disabilities, the difficult to serve, and those with special needs.

Commissioner Romanow in his final 2002 report makes three recommendations¹³² that could help integrate oral health promotion and disease prevention services into general health services. First, he recommends that the Canadian Population Health Initiative, currently managed by the Canadian Institute for Health Information, help to assess health promotion initiatives and measure the benefits of integrating prevention with primary health care. Second, he calls for a new Centre for Health Innovation that would focus on health promotion. Third, he recommends a Primary Health Care Transfer that would fast-track primary health care reform; it would be used in part to expand health promotion and prevention programs.

Educational institutions also have a role in integrating oral health services into general health services. Commissioner Romanow notes that one of the best ways of ensuring that health care providers work effectively in integrated settings is to begin with their education and training.¹³³ There is currently a growing literature on interprofessional learning and health care delivery for health professionals and educational institutions are moving to explore this area. For example, at Dalhousie University, there is a Tri-Faculty Inter-Professional Academic Advisory Committee that has undertaken a major initiative in interprofessional learning among three faculties including medicine, dentistry, and health professions.¹³⁴ This type of initiative can raise awareness about the link between oral health and general health and can enhance students' abilities to work in interprofessional teams.

CDHA recommends that

- the federal government establish a nationwide oral health care human resources strategy that
 - provides guidance for the provinces/territories and ensures that they eliminate legislation that prohibits or inhibits the direct access to dental hygienists by the public and ensures that they allow access to care through alternative, non-traditional delivery systems;
 - addresses the need for alternative practice settings, equal distribution of oral health care professionals across the country, and a workforce that is representative of different ethnic populations and native languages;
- the federal government establish a plan for integrating oral health into general health that
 - ensures the Canadian Institute for Health Information (CIHI), through the Canadian Population Health Initiative, assesses oral health promotion initiatives and measures the benefits of integrating oral health prevention with primary health care;
 - creates a new Centre for Health Innovation focusing on health promotion (including oral health promotion);
 - ensures the provinces use the Health Transition Fund for Primary Care in part for expanding oral health promotion and disease prevention programs;
- provincial/territorial governments eliminate legislation that prohibits or inhibits direct access to dental hygienists by the public;
- federal/provincial/territorial governments
 - incorporate dental hygiene services into primary health care settings and general health services and programs;

- develop population-based strategies to address the oral health needs of the underserved population;
- provide increased public education on the importance of oral health and its positive effects on general health;
- build capacity at the community level in order to allow the public to contribute to their well-being and oral health;
- dental hygiene education institutions develop more opportunities for dental hygiene students to gain knowledge of and experience with interdisciplinary teams;
- health professional educational institutions integrate oral health promotion and disease prevention into the curriculum for all health professions.

Private insurance coverage

The following data on private insurance coverage come from various sources:

Statistics Canada¹³⁵

- Fifty-four per cent of those aged 15 to 24, 64% of those aged 35 to 44, and 21% of those 65-or-older had dental insurance.
- While 22% of the non-insured population cited cost as a factor for not seeing a dentist, just 6% of the insured group gave cost as the reason.
- Sixty per cent of those working had dental insurance compared with 41% of those not working.
- Seventy per cent of those with the highest income and 23% of those with the lowest income had dental insurance.
- Those with higher levels of education had higher rates of dental insurance coverage.
- The lowest rates for dental care utilization were found among low-income persons without insurance.

Canadian Institute of Health Information¹³⁶

- Among the lowest 40% of the income groups, only 25% had any kind of dental insurance and only 45% visited a dentist in 1996-1997. In the high-income group, 73% had dental insurance coverage and 81% reported visiting a dentist in that year.

The Political Economy of Dental Hygiene in Canada (Manga 2002)¹³⁷

- In Quebec, 40% of the population has dental coverage; in Ontario, 63% has coverage.

U.S. 1989 NHIS¹³⁸ and the Medical Expenditure Panel Survey (MEPS)^{139,140}

- Seventy per cent of people with dental insurance had at least one dental visit during 1989; only 50% of those without dental insurance reported at least one visit during the same period.
- Private insurance payments accounted for 43% of all dental expenditures (\$18 billion).
- Non-Caucasians with LSS and the elderly were less likely to have dental coverage.
- Those with dental coverage had a mean total expenditure that was almost double those without coverage (US\$417.20 versus US\$298.70, respectively).

- People at a low-income level made fewer visits to the dentist than did people at a higher income level, regardless of insurance coverage.

These data indicate that private dental insurance and income level have a profound effect on oral health care use and support a call for employers to adopt health insurance plans. This issue is of particular importance to women as they are less likely than men to have supplementary health benefits.¹⁴¹ Also, lack of insurance coverage has a greater negative impact on women than men because women generally have lower incomes than men.¹⁴² An increase in employer health plans may be limited by the fact that most of the larger unions are already covered.¹⁴³ A further limitation results from a trend toward increased part-time, temporary, and self-employment, which could also threaten existing coverage.¹⁴⁴

The data also show that income, employment, education, and middle age are associated with private dental insurance. Canadians obtain private dental insurance primarily through employment-based plans. Individuals without private dental insurance are generally those employed with small businesses, part-time workers, the unemployed, and retired seniors. For those without coverage through employment, the options are limited since there are few plans, charging high premiums and providing limited benefits.¹⁴⁵ These data support the need for public oral health coverage for the working poor and private employer-based dental plans for retired employees.

The fact that low-income individuals did not access oral health care even when they had insurance coverage suggests that, for LSS individuals and families, there are other significant factors involved in the decision whether or not to obtain oral health services. More research is needed to determine these factors. It is possible that LSS individuals are deterred from obtaining oral health services due to unaffordable co-payments or there could be other determinants of health issues at play here.

Finally, there is a dearth of Canadian oral health data compared with U.S. data. This situation highlights the need for the federal, provincial, and territorial governments to be more involved in surveillance research.

CDHA recommends that

- employers recognize the value of providing oral health insurance coverage for employees and retired employees;
- large employers consider the feasibility of providing on-site dental hygiene clinics for disease prevention, health promotion, screening, and referral to other health professionals as needed.

Policies of employers, insurance companies, and government programs

Access to care is also limited by policies of employers and insurance companies that prevent direct payment to dental hygienists for their services. Over the past several years, CDHA has worked on two projects that will have a positive impact on this issue. These include working with the Canadian Life and Health Insurance Association (CLHIA) to develop a National Dental Hygiene Care Claim Form and a CDHA National List of Dental Hygiene Services and System of Service Coding. The CDHA has also developed positive relationships with several insurance companies, which recognize that some provincial legislation now allows dental hygienists

to practise in alternative settings. As a result, these companies have adjusted their plans to allow payment for services performed by a dental hygienist.

Although there has been some progress, the majority of insurance companies still do not provide direct reimbursement to dental hygienists. Even in British Columbia where dental hygienists legally practise unsupervised and in their own practice, insurance companies still require the signature and billing number of a dentist before any payment is made. This is also required by many government-sponsored programs and for government employee programs. CDHA's work in this area continues.

So, on the one hand, dental hygienists in alternative practice settings are willing and keen to provide services to social assistance recipients who have difficulty finding a dentist to treat them. On the other hand, publicly sponsored programs and government employee benefits programs will not recognize dental hygienists in alternative practice settings. To increase public access, dental hygienists must be able to receive payment directly for their services regardless of the employment arrangement—working under contract, employed by a dentist, or working in his or her private business.

CDHA recommends that

- the federal government take a leadership role by directing the federal government employee benefits plans to reimburse dental hygienists directly for their services;
- the federal, provincial, and territorial governments change internal policies of public oral health programs to allow reimbursement of dental hygienists in alternative practice settings;
- private health insurance plans update dental plans to allow payment directly to dental hygienists for their services.

CONCLUSIONS

Oral health is an important part of overall health status. It is critical that all Canadians have adequate access to oral health services. The solutions presented in this paper recognize that improving access involves more than piecemeal improvements in one or two areas. There is a need to move beyond this to create a public oral health system that includes a comprehensive plan for human resources, legislation, research, and employers' health plans. This oral health system must address the unequal access of individuals in marginalized subgroups in society. The oral health system must be recognized as an integral component of the general health system. This vision is based on the needs of the public, supports the recommendations of significant health reports of Commissioner Romanow and Senator Kirby, and will allow more effective use of resources and better outcomes.

Dental hygienists—through work in their individual practices and with other health care professionals and through their professional organizations—have a vital role to play in spearheading initiatives that will create a comprehensive system that resolves national oral health access issues. CDHA is committed to promoting integrated action by governments, the education system, professional dental hygiene organizations, dental hygiene regulatory authorities, and the public to move toward the creation of an oral health care system that improves access to oral health.

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"Access Angst" ... continued on page 274

CDHA BOARD – HIGHLIGHTS OF MEETINGS

March 22, 2003 – Ottawa

Under the guidance of Janice Moore, the CDHA Board of Directors reviewed and amended all Governance and Executive Limitations Policies as well as Ends Policy E1: Mission/Purpose. The remaining policies will be reviewed in October 2003. (The complete Mission/Purpose and Priorities Ends Statements can be viewed on-line on the CDHA web site at www.cdha.ca, *Members Only* section, under *CDHA Priorities*.)

The Board welcomed Barbara Long as the SDHA representative, replacing Angela Yarnton.

The Board received a report from Sue MacIntosh, the CDHA Representative to the National Dental Hygiene Certification Board, and approved the appointment of Marcia Sampson as the new representative for the term beginning March 2003 and ending March 2006.

The Board received a report from Salme Lavigne, CDHA representative to the Commission on Dental Accreditation of Canada.

A teleconference will be scheduled to enhance the communication process between Karen Wolf, Barbara Gibb, Patty Wickstrom, and the CDAC, IFDH, and NDHCB representatives who do not attend the meetings of the CDHA Board of Directors.

Salme Lavigne was nominated by Barbara Gibb for the Distinguished Service Award and the Board unanimously approved the nomination.

The Board will not consider having a Public Board member at this time.

The Board accepted *Access Angst*, a CDHA position paper on oral health care issues. This paper is currently available on-line in the *Members Only* section, *Policy & Action* area, under *CDHA In Action*.

June 20, 2003 – Regina

The Board of Directors heard from some provincial representatives who were looking for guidance regarding the Scaling Module for Dental Assisting. The Board reaffirmed its approach in supporting dental hygiene through focusing on everything that a dental hygienist provides. However, it should be noted that CDHA is also collecting evidence and supporting provincial associations on this issue.

Nancy Hughes has agreed to let her name stand for President-Elect.

Barbara Long is assuming the position of Executive Director of SDHA as of July 2003. She will attend the October board meeting and notify CDHA of the name of her replacement for the term beginning in March 2004.

Dominique Dérome has agreed to represent FDHRA at the next CDHA Board of Directors Meeting in October 2003.

The Board agreed that CDHA will not again submit a bid for the 2007 IFDH Symposium should the opportunity arise. International Federation of Dental Hygienists Day will be October 8, 2003.

CANADIAN DENTAL HYGIENISTS ASSOCIATION CELEBRATED INTERNATIONAL FEDERATION OF DENTAL HYGIENISTS DAY BY ISSUING THE FOLLOWING PRESS RELEASE

Ottawa, October 8, 2003: Light Up Your Smile - Quit Smoking!! The Canadian Dental Hygienists Association joins over 350,000 dental hygienists worldwide in celebrating the International Federation of Dental Hygienists (IFDH) Day.

The theme this year is smoking, which is the largest single preventable cause of death and disability in the world today. In Canada, approximately 45,000 people die from smoking related diseases. In addition to these risks to good health, stained teeth and bad breath can make smoking a very anti-social habit! In fact, you increase your risk of developing gum disease if you are a smoker.

However, don't panic, help is at hand! Your dental hygienist can give you all the assistance you need to give up the smoking habit and enjoy a clean, healthy white smile. As part of the IFDH Day on October 8th 2003, information about smoking cessation programs will be available from participating dental offices. "The dental hygienist has regular contact with their patient which can help to achieve the best opportunity to quit the smoking habit," says IFDH President Dr. Kerstin Ohrn, from Darlana University, Sweden.

Please visit the IFDH web site at < www.ifdh.org >.

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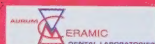
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Official Meeting of the Association of Dental Surgeons of BC

UBC RESEARCHERS WIN GRANT FOR ERGONOMICS HEALTH PROMOTION IN B.C. DENTAL OFFICES

Drs. Lance Rucker (UBC Faculty of Dentistry), Susanne Sunell (Vancouver Community College), and Carl Cramer (also from UBC) have been given an opportunity to assess the best methods for encouraging and helping B.C. dental hygienists, dentists, and assistants to improve their musculoskeletal health, quality of life, and productivity. Their new Workers' Compensation Board grant builds on an earlier WCB grant to Rucker and Sunell that detailed how dental hygienists and dentists could identify whether they were at risk for developing various ergonomically based strain injuries while working in their clinical professional practices.

The 2001 WCB research report identified certain profiles of practice behaviours, as well as equipment layout and usage that were associated with increased risks to dental office personnel for experiencing musculoskeletal pain. The new project is directed toward the development and testing of specific ergonomics health promotion materials and voluntary guidelines (both written and web-based) that will effectively transfer this ergonomics knowledge into the clinical workplace, and determine whether this knowledge can reduce or eliminate high-risk practice profiles.

DENTAL HYGIENE STUDENT AWARDS

The College of New Caledonia, Prince George, B.C., is pleased to announce the CNC winners of the College of Dental Hygienists of British Columbia's first-year dental hygiene awards: Clinical Proficiency - Gwen Nolan; Academic Proficiency - Andrea Muldoon; Highest overall standing - Jessica Dichow. The awards were presented at CNC on September 2, 2003, by Wendy King on behalf of CDHBC.

"Access Angst" (continued from page 272)

140. Manski, R.J., Macek, M.D., Moeller, J.F.: Private dental coverage: who has it and how does it influence dental visits and expenditures? *J Am Dent Assoc* 133(11): pp. 1551-1559, 2002
141. Armstrong, P.: National Coordinating Group on Health Care Reform and Women - Speaking notes for the public consultations of the Commission on the Future of Health Care. May 30, 2000
142. U.S. Department of Health and Human Services: Oral Health in America. Op. cit.
143. Manga, P.: The political economy of dental hygiene in Canada. Op. cit.
144. Canada. Human Resources Development Canada: Employer-sponsored benefits - not to be taken for granted. *Applied Research Bulletin* No. 4: pp. 11-13, 1998
145. Manga, P.: The political economy of dental hygiene in Canada. Op. cit.

Abstracts from the American Association for Dental Research

Research findings were presented at the 2003 annual meeting of the American Association for Dental Research in San Antonio, Texas. The abstracts are published in designated issues of the *Journal of Dental Research*. CDHA has been granted permission to re-print a selection of these abstracts in *Probe*.

CARIES

1336 THE ASSOCIATION BETWEEN CARIES IN PERMANENT AND PRIMARY TEETH

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Objectives: Previous investigations have shown a relationship between caries in the primary and permanent dentitions. The purpose of this study is to further characterize this association by examining the difference in number and timing of restorations in the permanent dentition based on caries experience in the primary dentition. **Methods:** Using electronic databases, children born to members of Kaiser Permanente Northwest between January 1, 1986 and December 31, 1994, and who had continual coverage for at least 5 years from birth were identified. Of these, only children with at least one dental visit before the age of 5 were included in this study. These children were followed until June 30, 2001, 69% having eligibility through this entire follow-up period. Children who had a restorative procedure in any primary tooth before the age of 5 were classified as having early childhood caries (ECC). Restoration counts and times (possibly censored) to first restoration on permanent teeth were obtained for all children included in the study. **Results:** Overall 4,712 children met the above criteria with 1,424 of these in the ECC group. Using Poisson models, restoration rates in permanent teeth were compared for the two groups. The restoration rate in permanent teeth for the ECC group was estimated to be 1.4 times that for the non-ECC group (95% CI: (1.3, 1.5)). Survival analysis methods indicate that ECC children were more likely to have a restoration to a permanent tooth at a younger age than non-ECC children (95% CI for Hazard Ratio (1.8, 2.3)). **Conclusion:** ECC children appear to have higher restoration rates in the permanent dentition than non-ECC children. In addition, these restorations tend to occur earlier for ECC children. Early intervention and frequent follow-up for ECC children may aid in prevention of caries in later childhood.

CARIES

1714 PREVALENCE OF YEAST IN THE ORAL CAVITIES OF CHILDREN TREATED WITH INHALED CORTICOSTEROIDS

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Objective: To verify the presence of the *Candida* spp. in the oral cavity of children in treatment with inhaled corticosteroids. **Materials and Methods:** Two groups composed of 30 children each were studied. One group was the children treated with corticosteroids and the other group was the control. Saliva samples were collected through oral rinses with phosphate-buffered saline (PBS). The samples were plated on Sabouraud dextrose agar and incubated at 37°C for 48h. The colony-forming units (CFU)/ml of saliva were counted and the samples isolated were identified and characterized phenotypically. **Results:** *Candida* genus yeasts were isolated from 43.33% of children treated with corticosteroids and 30% of the control group. However, no significant statistical difference was observed between the groups. *C. albicans* was the most prevalent species in both the groups, followed by *C. guilliermondii*, *C. parapsilosis*, *C. stellatoidea*. Furthermore, *Rhodotorula* spp. and *C. lusitanae* were also isolated in the treated group. **Conclusion:** There was not a significant increase in the prevalence of *Candida* spp. in the oral cavity of children treated with inhaled corticosteroids.

CARIES

0676 EFFECTIVE TREATMENT OF OCCLUSAL FISSURE CARIES USING OZONE

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Ozone has been shown to clinically reverse primary root carious lesions and early occlusal fissure caries. **Objectives:** This study assessed the effect of a novel ozone delivery system (HealOzone unit, CurOzone USA) on primary occlusal fissure carious lesions over a 1 month period. **Methods:** 35 patients attending a general dental practice were entered with 90 primary occlusal fissure carious lesions. Each carious lesion had been deemed to require drilling and filling and had a DIAGNOdent2 reading between 20 and 60 at baseline. After randomisation, lesions were assigned to either receiving no treatment or ozone treatment with each subject having at least one control lesion. Ozone was applied to each test lesion for 20 seconds. After 1 month, patients were recalled and clinically re-assessed for lesion severity. The DIAGNOdent (KaVo, Germany) was again employed to objectively quantify the primary occlusal fissure carious lesions. **Results:** After 1 month, 35 patients (90 lesions) were recalled for re-evaluation. There were no observed adverse events. Based on the clinical measurement of lesion severity, 59% of the ozone treated lesions showed visible signs of reversal, whilst 41% had remained stable ($P < 0.05$). 100% of lesions had been stabilised with no progression. When measured using the DIAGNOdent, 79% of the ozone treated primary occlusal fissure carious lesions had reversed and 18% remained stable. The control primary occlusal fissure carious lesions, which had not received any ozone treatment, did not significantly change clinically. **Conclusions:** This treatment regime using ozone is an effective alternative to "drilling and filling" for primary occlusal fissure carious lesions in general dental practice.

CARIES

0327 EFFECT OF SOFT DRINKS ON DENTAL ENAMEL

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Objectives: A high percentage of the population daily consumes significant amounts of a variety of soft drinks. Many of these beverages are of low pH, contain sugar and a variety of additives, predisposing factors for attack on dental enamel. This study compares enamel dissolution in regular and diet beverages. **Methods:** Small blocks of enamel were sectioned with a highspeed and diamond bur from sound extracted human premolar and molar teeth. The enamel blocks were measured and weighed and then immersed for a total of 14 days in diet and regular cola drinks, non-cola and caffeine-free drinks as well as root beer and bottled iced tea. Beverage pH values ranged from 2.46 to 4.8 with water (control) having a pH of 6.7. The enamel sections were weighed at regular intervals throughout the immersion period; at least two enamel blocks were exposed to each beverage. The data was subjected to 1-way ANOVA with post hoc Scheffé testing. **Results:** No enamel attack was found in water or root beer. The highest attack was found in iced tea followed by a diet non-cola, ginger ale and one cola. No correlation was found between enamel dissolution and beverage pH. There appeared to be little difference in enamel attack between regular and diet beverages from the same manufacturer. **Conclusions:** Continuous exposure of dental enamel to carbonated cola, cola-free drinks and bottled ice tea can cause enamel dissolution over extended exposure. Beverage pH did not correlate with the amount of enamel attack. Root beer and water appear to be the safest drinks to safeguard dental enamel.

1354 TOPICAL APF FLUORIDE FOAM AND CARIES DEVELOPMENT IN ENAMEL: AN IN VITRO POLARIZED LIGHT STUDY

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Objective: This in vitro laboratory study investigated the effects of 1 minute topical fluoride agents on caries formation in enamel using polarized light microscopy. **Methods:** 16 human permanent teeth with macroscopically sound enamel surfaces were divided into 2 topical fluoride treatment groups. Following a fluoride-free prophylaxis, the buccal surfaces were exposed to the assigned topical fluoride agents: (1) Colgate Fluoro-Foam [1 minute 1.23% APF]; 2) Oral-B Minute-Foam [1 minute 1.23% APF]. Following fluoride treatment, the topical fluoride agent was removed with copious rinsing. An acid-resistant varnish was applied, leaving buccal treated enamel surfaces and lingual untreated control enamel surfaces exposed. Artificial caries were created using a modified ten Cate solution with an exposure time of 7 days. Longitudinal sections were prepared (10 per specimen) for polarized light study (water imbibition) and lesions depths were determined and compared among groups (ANOVA, DMR). **Results:** Mean lesion depths were as follows: $186 \pm 26 \mu\text{m}$ for Controls; $97 \pm 23 \mu\text{m}$ Colgate Fluoro-Foam; and $83 \pm 22 \mu\text{m}$ Oral-B Minute-Foam. Both fluoride treatments resulted in significant reductions ($P < 0.05$) in lesion depth compared with the nontreated control group. Colgate Fluoro-Foam had a 48% reduction in lesion depth; while Oral-B Minute-Foam had a 54% reduction in lesion depth. **Conclusions:** Topical fluoride provides a means to substantially lessen in vitro lesion formation in sound enamel. A single 1 minute exposure to APF foam provides a significant degree of caries protection against an in vitro caries challenge.

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INFECTION CONTROL

1070 EVALUATION OF HYDROGEN PEROXIDE FOR DENTAL UNIT WATERLINE CONTAMINATION CONTROL

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Objectives: The objectives of this study was to evaluate use of two concentrations of hydrogen peroxide (H2O2) for cleaning dental waterlines and also for use as an irrigant in providing dental treatment water of acceptable microbial quality. **Methods:** Three dental units with mature biofilms with effluent water contaminated $> 4.6 \log_{10}$ cfu/mL. Two units used 3% as a cleaner with 5 minutes contact and used 0.3% H2O2 as an irrigant (600mL/day). The third dental unit had no chemical treatment but for a 1 minute flush every hour six times/day. **Results:** Laser confocal microscopy showed mature viable biofilm at baseline in all units. The H2O2 treated dental units showed no biofilm at the end of the study with mean effluent contamination $< 1 \log_{10}$ cfu/mL. The control units showed mature viable biofilm at the end of the study with mean effluent concentration $> 4.6 \log_{10}$. **Conclusions:** In this study H2O2 when used at 3% as a daily flush removed biofilms. 0.3% H2O2 was efficacious in controlling contamination in the effluent. SBIR Phase-1 grant to Lynntech Inc. (Subcontract TAMRF to BCD TAMUS)

INFECTION CONTROL

1073 A NATIONAL SURVEY OF DENTAL HYGIENISTS' INFECTION CONTROL ATTITUDES AND PRACTICES

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Objectives: The objectives of this study were to investigate the infection control practices of practicing dental hygienists, to document the attitudes and practices of dental hygienists toward patients with infectious diseases, and to determine if infection control attitudes affect how dental hygienists treat infectious disease patients. **Methods:** A 49-item survey consisting of eight demographic, nine attitudinal, and thirty-two practice questions was used for this study. A stratified sampling method was used in which the United States was divided into four regions. Three states were selected from each region according to geographic location and population. Five percent of registered dental hygienists within each selected state were randomly selected for inclusion in the study. All analyses were conducted using the Statistical Package for Social Scientists (SPSS v.10). **Results:** Of the 2009 surveys mailed, 104 were undeliverable. A total of 856 completed surveys were returned from practicing dental hygienists for a response rate of 44.9 percent. A majority of respondents (53.9%) felt that treating patients with HIV or AIDS increased their personal risk for contracting the disease. Chi-square analysis revealed southern and western regions reported greater frequencies in perceived personal risk when treating HIV/AIDS patients ($\chi^2 = 8.739$, $p = 0.033$). The majority of respondents also reported always or often using extra precautions with HIV/AIDS patients (63.5%) and Hepatitis patients (60.1%). In addition, most respondents reported they would not use an ultrasonic scaler when treating HIV/AIDS (65.8%) or Hepatitis (58.9%) patients indicating an alteration in clinical practice habits. **Conclusion:** The majority of dental hygienists surveyed reported altering infection control practices and treatment techniques when treating HIV/AIDS or Hepatitis patients. Supported by DENTSPLY International, York, PA, VA North Texas Health Care System Homeless Veterans Dental Program, and Baylor College of Dentistry Research Funds.

ORAL HYGIENE

0495 EFFICACY OF A BRUSH, FLOSS, RINSE REGIMEN COMPARED WITH BRUSHING AND FLOSSING

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Introduction: This six-month randomized, observer-blind, parallel, controlled clinical study was conducted to determine the incremental benefit of rinsing with an essential oil-containing (EO) antiseptic mouthrinse (Cool Mint Listerine Antiseptic) in conjunction with daily flossing and usual toothbrushing compared to daily flossing and usual toothbrushing on inhibition of plaque and gingivitis development. Usual toothbrushing and placebo rinsing served as the negative control. **Method:** 237 evaluable subjects completed the study. Following a complete dental prophylaxis healthy adults with mild to moderate gingivitis were randomized into treatment groups 1) brush, floss, EO rinse, 2) brush, floss, placebo rinse, or 3) brush, placebo rinse. All subjects received written home care instructions. To maximize compliance, flossing subjects received a flossing demonstration and had to demonstrate correct flossing technique at baseline. All subjects were monitored monthly for compliance with their assigned regimen. The efficacy variables were whole mouth and interproximal gingivitis (MGI) and plaque (PI) at three and six months. **Result:** Group 1 whole mouth reductions in MGI of 29.9% and PI of 56.3% vs group 3 (control) demonstrated the benefit of a brush, floss, EO rinse regimen. Group 1 had statistically significantly lower interproximal and whole mouth plaque and gingivitis scores than groups 2 and 3 ($p < 0.001$). The incremental benefit of an EO rinse to brushing and flossing was clinically significant with reductions in interproximal MGI of 15.8% and PI of 47.7% after 6 months. The additional benefit of flossing compared to brushing alone was also statistically significant ($p < 0.001$), with reductions of 7.7% in MGI and 8.9% in PI. **Conclusion:** These results suggest that rinsing with an EO rinse as an adjunct to daily flossing with usual toothbrushing provides incremental efficacy in helping to reduce gingivitis and plaque.

0502 USE OF CHAIRSIDE EQUIPMENT TO COMPARE THE EFFECTS OF TONGUE-CLEANING DEVICES ON REDUCING ORAL MALODOR

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Objectives: A pilot study was performed to evaluate the use of chairside equipment (sulfur compound detection) and to compare the reduction of oral malodor following use of 4 tongue cleaning devices: an ADA reference manual toothbrush, a tongue brush, a stainless steel tongue cleaner, and a Sonicare® toothbrush. **Methods:** Efficacy of tongue cleaning was evaluated using a randomized, parallel arm design. Forty healthy subjects were recruited and components of malodor measured 2 hours after brushing at baseline and following 2x daily use of the assigned tongue cleaner for 1 and 4 weeks. Oral malodor was measured using a Halimeter® (Interscan Corp, Chatworth City, CA) to measure volatile sulfur compounds (VSCs) and using a tongue sulfide probe (Diamond General Development Corp., Ann Arbor, MI) to measure sulfur ions directly on the surface of the tongue. In addition, tongue plaque samples were collected and anaerobic bacteria enumerated. **Results:** Following 1 and 4 weeks' use there was a visible improvement in the appearance of the tongue for all groups. At 4 weeks there was a 36.0%, 42.3%, and 34.7% reduction in VSCs for the manual, Sonicare and tongue brush, respectively. The stainless steel tongue cleaner had an overall increase (20%) in VSCs. No significant differences between the groups were observed following 1 or 4 weeks use for VSCs, tongue sulfur ion concentration or anaerobic bacteria. Tongue sulfur ion levels were significantly correlated to VSCs ($p=.027$) and anaerobic bacteria counts ($p=.025$). **Conclusions:** The results from this study indicate that these instruments may be useful in monitoring a subject's response to treatment of oral malodor. The results suggest that tongue brushing may provide a better means of reducing components of oral malodor than use of a rigid device.

1392 EFFECTS OF CHLORHEXIDINE-COATED BRISTLES ON RESIDUAL MICROBIAL CONTAMINATION OF TOOTHBRUSHES

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Previous studies have shown that toothbrushes harbor and transmit microorganisms. Patients can re-infect themselves with these contaminated toothbrushes. **Objective:** The purpose of this study was to determine the residual microbial contamination of toothbrushes containing chlorhexidine-coated bristles (experimental brush) for three periodontal pathogens *Provetella* species (Ps), *Porphyromonas gingivalis* (Pg), *Actinobacillus actinomycetemcomitans* (Aa) and total non-specific microflora (TC). **Methods:** Twenty patients meeting periodontal inclusion criteria were placed in one of the following groups: Group 1a: quadrants 1&4 brushed with the experimental brush (10 patients), Group 1b: quadrants 2&3 from group 1a brushed with control brush, Group 2a: quadrants 2&3 brushed with the experimental brush (10 patients), Group 2b: quadrants 1&4 from group 2a brushed with the control brush. Teeth were brushed without toothpaste using the Bass method for 30 sec. by a dental hygienist. Toothbrushes were rinsed for 5 sec. with water, tapped 3 times and stored in air for 24 hrs, then cultured anaerobically after vortexing. The plates were suitably incubated and counted. **Results:** Counts (CFU per ml) were made for Ps (control = 4.6×10^3 , experimental = 1.3×10^3); Pg (control = 9.0×10^6 , experimental = 1.6×10^6); Aa (control = 1.7×10^5 , experimental = 7.8×10^4) and TC (control = 3.8×10^7 , experimental = 1.1×10^7). Data were analyzed parametrically (paired t-tests) as well as non-parametrically (Wilcoxon signed-rank test) and differences between control and experimental groups for all organisms were significant at $p < 0.01$. **Conclusions:** Preliminary data indicated that there was a significant antimicrobial effect of toothbrushes containing chlorhexidine coated-bristles on both the residual count of these three periodontal pathogens as well as on the residual total counts of all organisms harbored on the toothbrushes. Supported in part by John O. Butler Co.

0180 DURATION OF REDUCTION OF DENTINAL HYPERSENSITIVITY AFTER PROPHYLAXIS WITH A CALCIUM/ARGININE BICARBONATE CARBONATE PASTE

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Dentinal hypersensitivity frequently occurs after scaling and root planing (SRP) and is a frequent reason that patients avoid this disease preventing therapy. Earlier (*J. Dent. Res.* 80:1243, 2001) we demonstrated substantial reduction in sensitivity after SRP using a prophylaxis paste (ProClude™, Ortek Therapeutics, NY) containing a calcium/arginine/bicarbonate/carbonate complex which has been named SensiStat™. **Objective:** The purpose of this study was to determine in a 28 day study the longevity of sensitivity relief after a single application of the ProClude™ prophylaxis paste. **Methods:** 21 subjects with canine and premolar teeth sensitive to air from a dental air syringe or scratch with the Scratchometer were selected. A total of 253 teeth were studied, 2/3 of which were non-sensitive to scratch and/or air. Non-sensitive teeth are always included as controls to ensure that a test agent does not increase dentinal sensitivity. After baseline evaluation for sensitivity to scratch and air, all subjects received SRP treatment. Sensitivity was immediately measured and repeated 3, 7, 4, and 28 days thereafter. ANOVA was performed for each testing method for both sensitive and non-sensitive teeth to determine significant differences. **Results:** Large reductions in sensitivity and in the number of sensitive teeth occurred immediately after the prophylaxis and the reductions were fully sustained for the 28-day study period. Sensitivity to air was reduced 71.7% and to scratch it was 84.2%. Sixty percent of the sensitive teeth became totally non-sensitive to air; 77.4% became totally non-sensitive to scratch. All changes were highly significant ($p < 0.001$). **Conclusion:** A prophylaxis paste containing the calcium/arginine/bicarbonate/carbonate complex, SensiStat™ substantially reduced dentinal sensitivity for 28 days and there was no trend towards the return of sensitivity by the end of the study.

1757 INVESTIGATION OF THE INFLUENCE OF A POWERED TOOTHBRUSH'S BRISTLE MOTION ON PLAQUE REDUCTION AND SAFETY

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One of the key design features that determine the efficacy of a powered toothbrush is the manner in which the bristled portion of the brush head is activated. **Objective:** The objective of this study was to compare the plaque reduction efficacy and safety of a prototype sonic toothbrush in which the brush head moves in a twisting motion (prototype) to a Sonicare® (Philips Oral Healthcare Inc.) which has a sweeping motion (control). **Method:** An examiner-blinded, randomized crossover study was conducted with 12 healthy adults. Subjects meeting the entrance criteria were disclosed and screened for plaque using the Turesky modification of the Quigley-Hein Plaque Index. Subjects with an index of at least 1.9 following 12 to 16 hours of oral hygiene abstinence were entered into the study. The subjects were randomized into one of two treatment groups and brushed for two minutes with the control toothbrush and for two minutes with the prototype brush. Following a period of 24 hours without oral hygiene, subjects were disclosed and scored for plaque. After brushing with a randomly selected device, an intraoral examination was performed. Subjects were disclosed again and re-evaluated for post-brushing plaque, after which they brushed for an additional two minutes with the control device. Three more evaluations were conducted, each within 24 hours of the last using the same procedures, resulting in each device being used twice. **Results:** The improvement of the prototype over the control was 16%, 16%, and 20% for the overall, interproximal, and posterior regions, respectively. No soft tissue abnormalities were noted with either brush. Analysis of variance showed the difference between the two brushes was statistically significant at the 95% confidence level for each region. **Conclusion:** The prototype sonic toothbrush with the twisting motion achieved statistically superior plaque reduction as compared to the control toothbrush ($p < 0.05$).

WHITENING

1036 CLINICAL TRIAL COMPARING WHITENING STRIPS AND A PAINT-ON TOOTH WHITENER

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Objective: This randomized clinical trial was conducted to evaluate the efficacy and safety of a new "paint-on" tooth whitener relative to a marketed control. **Methods:** After balancing for age and baseline color, adult volunteers were randomized to a carbamide peroxide paint-on liquid with a brush applicator, or 6.0% hydrogen peroxide bleaching strips. Subjects were instructed to treat the maxillary and mandibular arches twice daily for 7 days. Whitening was measured objectively as $L^*a^*b^*$ after 7 days from digital images of the anterior dentition. **Results:** The 14 evaluable subjects ranged in age from 23 to 57 years. After 7 days, the strips yielded a statistically significant ($p < 0.05$) reduction in yellowness (Δb^*) and lightness improvement (ΔL^*), while the paint-on did not differ significantly ($p > 0.05$) from baseline. Whitening strips used simultaneously on the maxillary and mandibular teeth provided over 7 times greater whitening efficacy with respect to Δb^* relative to the paint-on whitener with adjusted means and standard errors of -1.31 ± 0.085 and -0.18 ± 0.085 , respectively, with these groups differing significantly ($p < 0.0001$). Only the paint-on exhibited a significant change in redness, though this was in the wrong direction for bleaching agents. After 7 days, the adjusted mean Δa^* was 0.42 ± 0.100 for the paint-on, differing significantly ($p < 0.002$) from baseline. Mild tooth sensitivity was reported for 3 subjects using the hydrogen peroxide strips. There were no other meaningful adverse events, and no subjects discontinued treatment early. **Conclusion:** The 6.0% hydrogen peroxide whitening strips provided over 7 times greater whitening efficacy than a carbamide peroxide paint-on liquid, while the latter significantly increased tooth redness.

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NUTRITION

1013 DIETARY FIBER AND WHOLEGRAIN MAY REDUCE PERIODONTITIS RISK

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Dietary fiber and wholegrain may mechanically clean teeth, improve insulin sensitivity and glucose metabolism, reducing advanced glycation end product deposition in tissues, and could thus reduce periodontitis risk. **Objective:** We prospectively examined fiber and wholegrain intake and periodontitis risk. **Methods:** We had dental radiographs taken between 1986 and 1998 for 166 participants of the Health professionals Follow-up Study. A periodontist measured radiographic bone loss (mm) using a periodontal probe, at two interproximal sites for all posterior teeth excluding third molars. Periodontitis was defined if there was 5 mm or more bone loss at one or more sites. Mean bone loss was also calculated. We had longitudinal, biennially updated data from 1986 to 1998 of self-reported tooth loss, professionally diagnosed periodontitis, and medical and lifestyle factors among 45,098 of these male, predominantly white (91%), US health professionals aged 40 to 75 years in 1986. Diet was measured with a validated food frequency questionnaire in 1986, 1990, and 1994. We used intakes of fiber (g) and wholegrain (daily servings) before the date of the radiograph, report of periodontitis or tooth loss. We adjusted for age, smoking, diabetes, body mass index, alcohol intake, and total energy intake in the multivariate models. **Results:** Men with radiographically diagnosed periodontitis on average ate less fiber (3.7 versus 5.4 g/d, p -value < 0.001) and wholegrain (1.1 versus 1.7 servings/d, p -value = 0.03) after multivariate adjustment. Men consuming more cereal fiber and wholegrain were at lower risk of self-reported periodontitis comparing extreme quintiles (RR for cereal fiber = 0.89, 95% CI 0.77-1.03, p -value for trend = 0.04, RR for wholegrain = 0.81, 95% CI 0.70-0.93, p -value for trend < 0.001) and lost fewer teeth (p -value for cereal fiber = 0.001, p -value for wholegrain < 0.001), after multivariate adjustment. **Conclusion:** Dietary intake of cereal fiber and wholegrain may reduce risk of periodontitis and tooth loss. Supported by NIH Grants CA55075, HL 35464, DE12102 amerchan@hsph.harvard.edu

MICROBIALS

1747 *HELICOBACTER PYLORI* IN DENTAL PLAQUE AND SALIVA

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Objective: *Helicobacter Pylori* has been associated with gastric diseases, including cancer. Its presence has been demonstrated in dental plaque and saliva. The oral cavity could, thus, become a reservoir for *H. pylori*. The present study was designed to assess the degree in which *H. pylori* is found in dental plaque and saliva of individuals with periodontal disease. **Methods:** 30 periodontitis patients participated. 15 had a history of gastric problems while 15 did not. A full mouth periodontal examination was provided. Dental plaque was collected with Gracey curettes. Saliva samples were obtained with paper points. They were evaluated using genic amplification tests of the PCR type. Specific primers were created for the gene that codifies the RNAR 16S for *H. pylori*. The specificity of the primers was proven, showing no crossed reaction against any other related microorganism. **Results:** 86.7% of dental plaque samples from 15 periodontitis patients without gastric symptoms were negative to *H. pylori*, but 13.3% were positive. 43.3% of subjects with gastric symptoms were positive to *H. pylori* in dental plaque samples. Saliva samples were negative throughout. **Conclusions:** (1) *H. Pylori* can be detected in dental plaque of periodontitis patients using PCR methodology. (2) It is not detected in saliva. (3) The pocket could represent a transitory reservoir for *H. pylori* in subjects with gastrointestinal symptomatology.

ORAL HEALTH PROMOTION

0010 EVALUATION OF AN ORAL HEALTH PROMOTION PROGRAM FOR URBAN MINORITY INFANTS AND TODDLERS

R.L. HARRISON¹, T. WONG¹, and Y. PHUNG², ¹ University of British Columbia, Vancouver, Canada, ² Vancouver-Coastal Health Authority, Canada

Objective: The objective of this project was to design, implement and evaluate an oral health promotion program for inner-city Vietnamese infants and toddlers in Vancouver, Canada. **Methods:** The project comprised four phases: information gathering, project planning, project implementation, and project evaluation. Baseline information-gathering for a convenience sample of preschool children revealed a dmfs, mean(S.D.), of 9.5(10.5); a bottle containing milk was sipped during the day and used during sleep-time by most children. Replies to true-false questions suggested a lack of parental belief in the importance of baby teeth. The program's primary activity was one-on-one counseling at infant immunization visits by a Vietnamese lay health counselor, followed by telephone reminders. **Results:** Over an almost 7-year period (March 1995-December 2001), 134 twice-monthly clinics were held; 32 mothers had 1 counseling session, and 112 mothers had > 1 counseling session. 60 unscheduled "drop-in" visits by mothers seeking oral health information also occurred. 66/112 (59%) of all participating children attended one of 4 follow-up clinics at which dental assessments were performed and mothers were interviewed about child-feeding habits. At each follow-up, a significantly fewer number of mothers of 12-60 month old children reported their child using, or ever having used, a sleep-time bottle or a daytime comfort bottle, and a significantly greater number of children had stopped the bottle by 2 years of age compared to baseline, $p < 0.001$. Dental health measured by mean dmfs was significantly better compared to baseline for 19-60 month old children, $p < 0.05$. **Conclusion:** One-on-one counseling with regular telephone reminders provided by a lay person of similar background and culture to participants is an effective way to facilitate adoption of healthy behaviors and to improve oral health of children. This project has been funded by the Community Health Innovation/Sharon Martin Fund of the Vancouver-Coastal Health Authority.

LOW BIRTH WEIGHT

0993 OBSTETRICIANS' KNOWLEDGE AND PRACTICE BEHAVIORS CONCERNING PERIODONTAL DISEASE AND PRETERM LOW BIRTH WEIGHT

C. ROBINSON, S. LIEFF, R. WILDER, K. BOGGESE, S. BENEDICT, and C. PHILLIPS, University of North Carolina, Chapel Hill, USA

Objective: Recent evidence has shown that periodontal disease may be a risk factor for preterm low birth weight (PTLBW). This study assessed obstetricians' knowledge and practice behaviors concerning periodontal disease and its effect on preterm low birth weight. **Methods:** 194 practicing obstetricians in a five county area in central North Carolina that included three teaching hospitals were surveyed. Second and third mailings were sent to nonrespondents (N=55). Descriptive statistics and bivariate analyses were calculated using SAS. **Results:** Fifty six physicians in the population were ineligible due to retirement, no longer practicing obstetrics or no longer in the study area. Of the remaining 138 eligible physicians, 55 responded yielding a 40 % response rate. Sixty six percent were male, the mean age was 46 years, 78% worked in a group private practice and 42% had been practicing for more than 15 years. Ninety four percent indicated bacteria, 73% tooth decay, 69% aging and 51% excess sugar as possible risk indicators. Twenty two percent looked into patients' mouths at initial prenatal examination, 9% periodically, and 48% only when a problem was mentioned by the patient. Forty nine percent rarely or never recommended a dental examination. When asked about definite risk/ possible risk factors that might contribute to PTLBW, 99% responded smoking, 94% preeclampsia, 84% periodontal disease, and 79% bacterial vaginosis. Eighty four percent considered periodontal disease to be as important a risk factor to PTLBW as those currently known in obstetrics practice. **Conclusion:** Data from this study demonstrate that there is knowledge of periodontal disease and its potential role as a pregnancy risk factor but suggest limited incorporation of dental care into clinical practice. This study was supported by the ADHA Institute for Oral Health.

DENTAL ANXIETY

0983 DENTAL FEAR OF ADULT PATIENTS - THE ROLE OF PERSONALITY

F. ORLANDO, University of Michigan, Ann Arbor, USA, and M.R. INGLEHART, University of Michigan, Ann Arbor, USA

Dental fear is a wide spread phenomenon that leads to a variety of oral health problems. **Objectives:** This study explores how adult patients' personality affects the level of dental fear when arriving at a dental office. **Methods:** Data were collected from 105 regularly scheduled patients (43 males, 62 females; age range: 18 to 85 years; average age: 45 years) of the undergraduate clinic at a Midwestern dental school. The patients responded to a self administered survey before their dental treatment. Dental fear was measured with the Dental Anxiety Scale - Revised (DAS-R; Ronis et al, 1995). Personality traits assessed were state and trait anxiety (State - Trait Anxiety Inventory, STAI; Spielberger, 1983), and desire for control (IDCI; Iowa Dental Control Index). **Results:** Dental fear at the beginning of a dental appointment is significantly correlated with state anxiety ($r=.58$; $p=.000$), trait anxiety ($r=.35$; $p=.000$), and desire for control ($r=.55$; $p=.00$). Analyses of variance show that patients with low vs. medium vs. high state and trait anxiety, and desire for control have significantly different dental fear (state anxiety: means: 7.32 vs. 8.97 vs. 12.72; $p=.000$; trait anxiety means: 8.07 vs. 9.28 vs. 11.27; $p=.02$; desire for control: 7.00 vs. 8.36 vs. 12.43; $p=.000$). Self perceived oral health and satisfaction with oral health are also significantly correlated with dental fear ($r=-.31$; $p=.000$; $r=-.49$; $p=.000$). **Conclusion:** These data show that independent of prior experiences, patients' personality, in particular their levels of state and trait anxiety, and their desire for control affect their level of dental fear before a dental appointment. Considering personality differences, esp. a patient's desire for control, in dental treatment situations can be beneficial for managing dentally fearful patients successfully.

FLUOROSIS

1330 PRIMARY TOOTH FLUOROSIS AND AMOXICILLIN USE DURING INFANCY

L. HONG, S.M. LEVY, J.J. WARREN, G.R. BERGUS, D.V. DAWSON, B.A. BROFFITT, and J.S. WEFEL, University of Iowa, Iowa City, USA

Objectives: Little is known about whether amoxicillin can cause enamel defects. The purpose of this study was to assess the association between amoxicillin use during infancy and primary tooth fluorosis. **Methods:** As part of the Iowa Fluoride Study, subjects were recruited at birth and followed prospectively with questionnaires at 6 weeks and 3, 6, 9, and 12 months to gather information on fluoride intake and amoxicillin use. 490 subjects (252 females and 238 males) were used for this analysis. Primary tooth fluorosis was assessed using a modified Tooth Surface Index of Fluorosis at 5 years of age. A case was defined as fluorosis on two or more primary teeth. Relationships between fluorosis and amoxicillin use were assessed. **Results:** 11% had fluorosis on two or more primary teeth, with primary second molars most commonly affected. 42% reported amoxicillin use by 6 months, with 74% by 12 months. The estimated mean numbers of days of amoxicillin use for amoxicillin users were 13.8 by 6 months and 29.4 by 12 months. In bivariate analyses, amoxicillin use for 6 weeks to 3 months ($OR=2.08$, $p=0.038$) and 3 to 6 months ($OR=1.85$, $p=0.036$) significantly increased the risk for fluorosis of primary second molars. Other factors (sex, birth weight, breast feeding, family income, parents' education, episodes of otitis media, and other antibiotics) were not significant. Mantel-Haenszel stratified analysis showed no significant interaction between fluoride intake and amoxicillin use. After controlling for fluoride intake, the adjusted risks of fluorosis were not significant for amoxicillin use during any of the reporting time intervals. In multivariable analyses with logistic regression, only fluoride intake was statistically significant ($p=0.0009$). **Conclusions:** Fluoride intake was most strongly predictive of primary tooth fluorosis, but amoxicillin could possibly play a contributing role in its development.

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Program Director Dental Hygiene

Canadian Therapeutic College, Burlington, ON, a rapidly growing college dedicated to the pursuit of excellence in private-post secondary education for health care professionals is seeking an individual to fill a Senior Faculty and Administration position as Program Director to the Dental Hygiene Program.

Expectations of the Role:

- administer the design and implementation of a dental hygiene program.
- provide leadership to the advisory board.
- liaison with the CDHO and Ministry of Education Training Colleges and Universities.
- implement all tasks required for accreditation of the dental hygiene program.

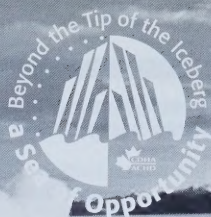
The ideal candidate will possess the following qualifications:

- University degree (Science, Commerce or Social Science)
- 5 years practical Dental Hygiene experience
- strong theoretical background experience in curriculum development
- strong administration and leadership skills
- past teaching experience an asset
- excellent people, communication and organizational skills

Interested applicants should submit their resume, in confidence to Kevin Sloan, Director, Canadian Therapeutic College 760 Brant Street, Burlington, Ontario, L7R4B7
By email: Kevin@canadiantherapeuticcollege.com

We thank all applicants for their interest, but only those selected for an interview will be contacted.

Call for Abstracts



15th Annual Professional Conference

Deadline for receipt of abstracts:
Midnight EST, Monday, January 12, 2004

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The Canadian Dental Hygienists Association (CDHA) is seeking abstracts for the scientific program of the 15th Annual Professional Conference to be held in St. John's, Newfoundland, June 25-27, 2004. The theme of the conference is "Beyond the Tip of the Iceberg, A Sea of Opportunity."

Scientific Program Format: There will be three different formats for the scientific program:

- *Oral presentations:* These will be 1-½ hours long and will be presented as concurrent sessions.
- *Poster presentations:* These will take place in a 1-½ period during the scientific program.
- *Table displays:* Table displays will take place in a two-hour period during the scientific program.

Abstract Categories: Abstracts can be submitted in the following categories:

- Case study or project
- Technology
- Informal research (e.g., reports, workshops, etc.)
- Formal research

Submission Guidelines:

- Submission of an abstract constitutes a commitment by the identified presenting author to be in attendance at the conference if the abstract is selected.

Submission Content: Your submission must include the three following elements:

1. Cover letter: Your cover letter must outline the following information: author(s); affiliation; address; city; province; postal code; e-mail; work and home telephone numbers; program format and abstract category of the submission. Author(s) must also disclose any sponsorship

agreement he/she may have in place as it relates to speaking engagements.

(N.B. If there are multiple authors, please identify the contact person with an asterisk (*) on the cover letter.)

2. Résumés: Your submission must include an abbreviated one-page résumé for each author.

3. Abstract: The abstract must be in electronic form (Microsoft Word or WordPerfect), no longer than 250 words, in 12 point New Times Roman, double-spaced, flush left, with no word breaks. The abstract is to include the title as well as a brief statement of the **objective, methods, results, and conclusions/outcomes**. Please ensure these four key words appear in the abstract immediately followed by a colon.

Submission Instructions: The abstracts and accompanying information must be submitted electronically. The submission can be sent by e-mail to abstracts@cdha.ca, no later than no later than midnight EST, Monday, January 12, 2004.

Evaluation Criteria: Abstracts will be evaluated in a blind peer-review process as follows:

- All of the requested information has been presented and properly ordered.
- The objective(s) and methods are clearly described.
- The results, including data and statistics when appropriate, are clearly described and based on accepted methodology.
- The conclusions/outcomes are clearly stated.

Selection Criteria: Abstracts will be selected according to the following criteria:

- Results of the peer-review evaluation;
- Professional experience and background of the author(s) based on their submitted résumé(s).

The selected abstracts will also be published in the Conference Program book and may be considered for publication in *Probe*, CDHA's official journal. All authors will be notified in writing whether their abstracts are accepted.

Honoraria and Expenses: The CDHA will provide author(s) with a complimentary registration for the conference as well as two (2) nights' accommodation. Any expenses incurred for abstract submission and/or travel to the conference are the responsibility of the author(s).

All information inquiries should be directed to:

Canadian Dental Hygienists Association
Membership and Conference Coordinator
96 Centrepointhe Drive
Ottawa, ON K2G 6B1
Tel.: (613) 224-5515
E-mail: mmp@cdha.ca

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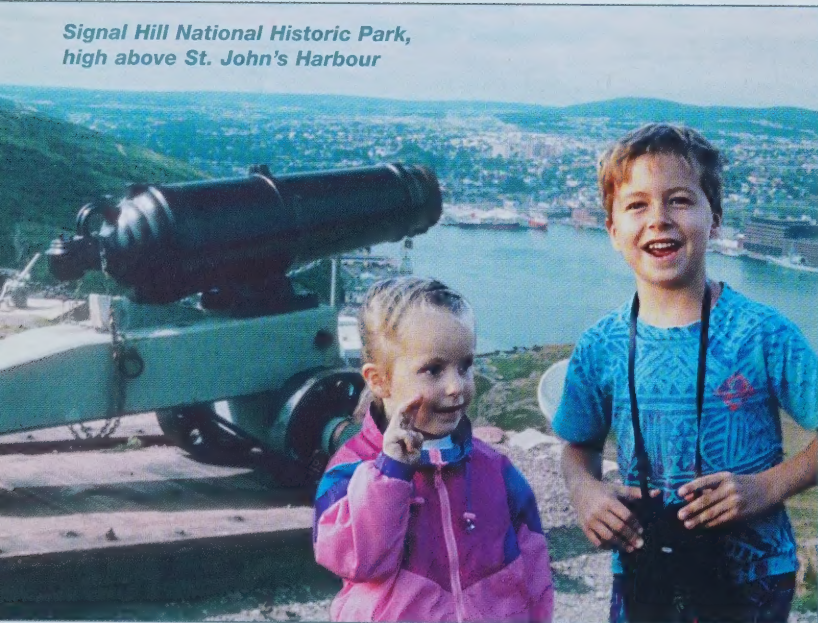
15th Annual Professional Conference

ON BEHALF OF THE NEWFOUNDLAND AND LABRADOR DENTAL HYGIENISTS ASSOCIATION, WE INVITE YOU TO ST. JOHN'S, NEWFOUNDLAND, FROM JUNE 25 TO 27 FOR THE CDHA 15TH ANNUAL PROFESSIONAL CONFERENCE.

Fun on the Rock – Make it a Family Affair!

Ever wonder why it's always *half an hour later in Newfoundland and Labrador*? Are *cod tongues* really what you think? What's in *Fish & Brewis*? Find out if the *Jigg* is up, what *Jiggs Dinner* is, and try the *Squid Jiggin' Grounds*.

Signal Hill National Historic Park,
high above St. John's Harbour



If you haven't yet planned your summer vacation, why not *bring the entire family*! While you attend the conference, they can take advantage of all that St John's has to offer with our *Children & Spousal Programs*, presented by the YMCA and a local tour operator. Indoor rock climbing, visits to local attractions, arts and crafts and movie night are just some of the activities your children will experience with our special program. Spouses will have the opportunity to enjoy a multitude of activities including golfing on championship courses.

Outside of the conference, you'll have time to join your family for all kinds of things! From history to geography, swimming to parks, games and everything in between, there are loads of things for the entire family to do.

See what the difference is between a *scuff* and a *scoff*, savour *toutons*—a truly Newfie staple—visit the home of the *Baby Leafs*, and check out the home of the birthplace of the cast from *CODCO*.

If you're into night life, you can't miss George Street! Wet your lips on Newfie brew, and dance the night away to your choice of music. It's a hoppin' place!

Gasp at the breathtaking scenic tours where icebergs visit in the summer, whale watching is a must, and the hospitality of downhome people will *knock your socks off*!

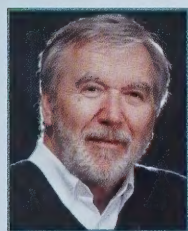
This is a truly unique family experience that you'll never forget! And remember, you don't have to go to Asia to experience the *Far East*!

Hotel Information

The 15th Annual Professional Conference will be hosted at The Fairmont Newfoundland. Located in the heart of St. John's, this facility provides superb views of the harbour, Signal Hill, and the historic city centre. The Fairmont Newfoundland was built in 1982 on the site of the original Newfoundland Hotel, which opened its doors on "the rock," as Newfoundland is commonly referred to, in 1926. The Fairmont Newfoundland's staff continues to carry on this tradition of friendly hospitality.

A block of guest rooms has been reserved at The Fairmont Newfoundland at special rates. To make your room reservations, contact The Fairmont Global Reservation Centre at 1-800-441-1414 and ask for the CDHA Conference rate. You may also reserve your guest rooms on-line by going to www.fairmont.com and selecting The Fairmont Newfoundland under "Hotels & Resorts." Once on The Fairmont Newfoundland homepage, select "Make a Reservation at this Hotel" to access the reservation screen. To receive the CDHA Conference rate, ensure that you enter GRDEN1 under the section IATA Code.

Keynote Speaker



Ed Smith, a native of Newfoundland, resides in Springdale with his wife. A graduate of Mount Allison University and Memorial University, Mr. Smith began teaching in 1966 and held various positions over the course of his career, including vice-principal

and principal, assistant superintendent as well as principal of a local community college campus. At the encouragement of his wife, Mr. Smith also started writing a weekly humour column, continuing this for 20 years. His articles and columns have appeared in such publications as the *Toronto Star*, *Reader's Digest*, and *Newfoundland Sportsman*. Mr. Smith has received many honours and awards, such as the award for excellence in broadcasting by the Canadian Nurses Association as well as an international Gabriel award for material "which inspired and uplifts the human spirit." Two and a half years after retiring, a severe car accident left Mr. Smith with a broken neck and quadriplegia; four years later, he is still unable to walk. His seventh book, *From the Ashes of My Dreams*, follows his experiences during 18 months of hospitalization and rehabilitation in various centres in Newfoundland and Ontario.

With his renowned sense of humour, Mr. Smith will provide us with an uplifting and inspiring keynote address, showing delegates the power of humour in overcoming life's challenges.

Photograph of the iceberg kindly provided by K. Bruce Lane
Photography of Holyrood, Newfoundland (www.lanephoto.com).



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Preliminary Program at a Glance

Thursday June 24, 2004

4 p.m. to 7 p.m. Conference registration opens

Friday June 25, 2004

7 a.m. to 8 a.m.	Conference registration
8 a.m. to 9 a.m.	Opening breakfast
9 a.m. to 10:30 a.m.	Concurrent scientific sessions
10:30 a.m. to 11 a.m.	Nutritional break
11 a.m. to 12:30 p.m.	Concurrent scientific sessions
12:30 p.m. to 2 p.m.	Lunch and table displays; poster presentations
2 p.m. to 3:30 p.m.	Concurrent scientific sessions
3:30 p.m. to 4 p.m.	Nutritional break
4 p.m. to 5:30 p.m.	Concurrent scientific sessions
Friday evening	Free time

Saturday June 26, 2003

7 a.m. to 8:30 a.m.	Conference registration
7:30 a.m. to 8:30 a.m.	Continental breakfast
8:30 a.m. to 10 a.m.	Concurrent scientific sessions
10 a.m. to 10:30 a.m.	Nutritional break
10:30 a.m. to 12 noon	Concurrent scientific sessions
12 noon to 3 p.m.	Lunch and Exhibit hall
3 p.m. to 3:30 p.m.	Nutritional break
3:30 p.m. to 5 p.m.	Concurrent scientific sessions
Saturday evening	Silent auction, dinner, and entertainment

Sunday June 27, 2003

9 a.m. to 11 a.m.	Breakfast key note address and closing ceremonies
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